

The Iron Age

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A Review of the Hardware, Iron and Metal Trades.

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Contemplated Improvements at Wellston, Ohio.

The people of Wellston, Ohio, have determined that the natural advantages of their immediate vicinity are worthy of more extended development than they have yet attained. The town is not altogether unknown to fame as a manufacturing center, having three blast furnaces and a nail mill, besides less prominent establishments, but it has been felt that places less richly endowed with mineral resources have taken rapid strides toward industrial pre-eminence while Wellston has moved forward too conservatively. Southern towns have boomed, Western towns have gone ahead at a prodigious pace, and even in Northern Ohio industrial growth has been wonderfully quickened, and the people of Wellston have determined to join the procession. The town is located in Jackson County, in the southeastern part of Ohio, within the limits of the famous Hanging Rock region, once known as among the most prominent iron-producing districts of the United States, and still held in excellent repute for the character of the iron made there, although other districts are now far in the lead as to production. The coal of Jackson County is abundant and easily mined, and it has long been used in its raw state for smelting ore in the blast furnace. At Wellston a shaft can be sunk near a factory site which will provide all the fuel needed without the expense of hauling it any distance. Iron ore is almost as easily obtained. Three railroads afford communication with the outside world, and connections will soon be established with four more. In addition to advantages for the manufacture of iron the adjoining country is covered with an abundance of second growth hickory and white oak suitable for the manufacture of wagons, carriages and other articles into the construction of which these woods enter.

For the purpose of actively pushing the work of developing the industries of Wellston a number of the enterprising citizens of that place have induced outside capitalists to unite with them in the formation of a strong corporation with comprehensive aims. The company has a capital of \$1,000,000 and is known as the Consolidated Wellston Coal and Iron Company. The managers of the company have outlined the following scheme of improvements which they hope to be able to carry into effect: They propose to add to the existing industrial establishments of the place two modern blast furnaces, one Bessemer steel plant, a nail-plate rolling mill and nail factory, a wire mill and wire-nail factory, a stove foundry, a pipe foundry, a rail and merchant rolling mill and a steel plant and blast furnace for the existing Wellston Steel and Nail Mill Company, whose nail factory is also to be doubled in size. But this is not all that is contemplated, as water works, gas works, a 4-mile street railway and a business block containing a large hotel and an opera-house are on the programme announced by the enterprising managers as among the intended undertakings of the company.

It is stated by the officers of the company that contracts are already being placed for the construction of a number of these enterprises, and that they will be pushed along as rapidly as circumstances will admit. Of course the publication of the company's plans has caused great activity in real estate in the vicinity of the town, but the extension of the town has formed part of their scheme, and the rise in value of near-by property has inured to their benefit, as large areas of residence property, as well as coal and iron ore lands, were acquired by them in advance of the announcement.

It must be confessed that at first sight this scheme seems too vast to be undertaken by a single company, and that perhaps the movement is simply a huge speculation. The construction of so many separate works would appear to be beyond the capacity of a single group of capitalists, who would probably find, in vulgar parlance, that "they had bitten off more than they could chew," and if persistently followed up would result in financial disaster to all concerned. But it appears that men of good judgment, excellent business capacity and known probity are at the head of the company. The officers are men who have achieved success in managing other industrial enterprises at Wellston and elsewhere, and who evidently realize the full nature of the stupendous project they have undertaken, as well as they feel assured of the capabilities of Wellston and its vicinity to sustain the undertakings which they have planned. In one respect, at least, they have shown excellent judgment. They have not organized a great movement for the development of a thinly-settled section of the country remote from railroads and far from the great centers of consumption, with undeveloped resources of a character imperfectly understood, but they have gone to work at home, where every step taken in the investment of their capital is directly under their own eyes, where markets for their products are within easy reach by established means of communication, where skilled and unskilled labor is abundant, and where the nature and extent of the mineral deposits have been demonstrated by actual mining and manufacturing operations of long standing. It is impossible to foretell what the outcome of

this particular scheme may be, as the best-matured plans of the ablest managers are subject to unexpected disaster from financial vicissitudes, and perhaps this company may be compelled by force of circumstances to curb its ambition before a third of its enterprises shall be set on foot, but the example which has been given to the country by the people of Wellston is one which can be studied with good results by the people of other towns and cities as richly endowed by

cast-steel forging upon the driving shaft. The worm gear is made of anti-friction or bell metal and bolted direct to the winding drum. The loose pulleys are lined with composition sleeves, and have large self-oiling chambers. The machine is also provided with an automatic stop-motion, which is set for the height of the travel of the car, and limits the number of revolutions of the winding drum, and is always sure to stop the car at the bottom and top, without

unwinding of the cables from the drum. It is also fitted with self-oiling loose pulleys, running on cast-steel shafts, cast-steel screw, cut from the solid forging and working in the composition screw-wheel, belted direct to the winding drum. The No. 7 machine has a 28-inch drum and a maximum load capacity of 3000 pounds. Five sizes of both right and left hand machines are turned out, ranging from No. 6 to No. 10, the former being rated at 3500 pounds capacity with a

map of the mouth of the Congo showed a most remarkable submarine gully, the contour lines of which were drawn from 202 soundings, many of these having been taken at intervals of less than one mile. In the mouth of this remarkable river a depth of no less than 1452 feet was found, the Thames in a similar locality giving only about 40 feet. The gully was distinctly traced 100 miles out at sea.

Large Engineering Enterprises.

This is an era of important engineering schemes. Aside from several of a formidable character such as the Nicaragua ship canal, the Tehantepec Railway, the Southside Railroad in San Domingo, and kindred enterprises in which New York capitalists are engaged, there are others more directly connected with home interests in various stages of incubation and which altogether involve many millions of money. The more immediate demand is to relieve travel and traffic in New York City from its congested condition. The transit problems comprise tunnels and elevated railways within the city, also tunnels and bridges to connect with the territory beyond. The latest plan is for an underground railroad from the City Hall to the Grand Central Station, in which the Vanderbilts, Astors, Lorillards and other representative capitalists are said to be interested, as a substitute for the Broadway scheme. This new plan provides for a four-track railroad through Elm street and Fourth avenue, with stations every four or five blocks for the way trains and double that distance for the express trains, the stations to be 400 feet long. Underneath the tracks the subway tunnel will be built, with separate apartments for steam, gas, water, and electric wire pipes, and sewers, tramways upon which to run pipe into the tunnels, and stations at various places along the line for the storage of tools and supplies, and by way of which the tunnel may be entered. The whole route is, furthermore, to be made bright as day by electric lights. As a motive power, it is said that either electricity or fireless steam engines will be employed. The cost of the tunnel is estimated at \$2,000,000 per mile.

Next, and in connection with the foregoing, we have a scheme for a tunnel from a point near St. Paul's churchyard to the foot of Rector street and thence under the Hudson River, to effect a junction between the railway systems of the North and East centering in New York and those of the South and West terminating at Jersey City. One of the organizers reports that the larger portion of the required capital has already been subscribed. Of a somewhat different character is a ground plan for traffic extension said to have been definitely perfected, the main feature of which is an extensive warehouse system, with capacious docks and stockyards, at Clifton and Southfield, on Staten Island, the design of which is to unite the far West through this port with the harbor of Barrow, in England. The projectors are the Furness Railway Company of England, who have made their arrangements in the West, and completed their purchases of large tracts of land at the points named, including 1500 feet of water front at Clifton, where the erection of warehouses to cost \$1,500,000 will begin next spring. Vice-President Boyle, of the Minnesota and Northwestern Railway, is reported as saying that there is no question about the work going forward as rapidly as time and the nature of things would admit after the winter is over. Capital in plenty was behind the scheme, and men of determination and wealth, with a definite purpose in view, were urging the enterprise forward. The bridge across the Kill von Kull is being pushed with all possible celerity by the Keystone Bridge Company, who have the contract for its construction. The Staten Island pier of the bridge is away above water, as is also that on the New Jersey shore, and gangs of men are at work on the two central piers.

In the same category of improvements we may include the Harlem ship canal, to connect the East River with the Hudson River, doing away with the detour at the Battery, and shortening the distance from 18½ to 8 miles. The water front will thus be extended by the addition of about 10 miles of wharves and docks. The preliminary borings are now in progress. Scarcely less important as affecting the general welfare is the extensive engineering work involved in the proposed sinking of the railroad tracks uptown, on the line of the New York Central and Eastern roads. Fine masonry and iron-work will be requisite, at a heavy expense, to the corporations concerned. A bridge across the East River at Blackwell's Island and the great cantilever bridge at Poughkeepsie, together with important dredging operations in the ship channels at Sandy Hook, should be included among new works in progress, and which, taken collectively, only foreshadow in a faint degree the future development of the great commercial metropolis.

Natural gas was struck on the 12th inst., about 12 miles south of Fort Smith, Ark. It was found at a depth of 175 feet by parties who were boring for coal. When lighted the flame is said to rise 40 feet above the ground. Hopes are entertained of finding gas in the limits of the city itself.

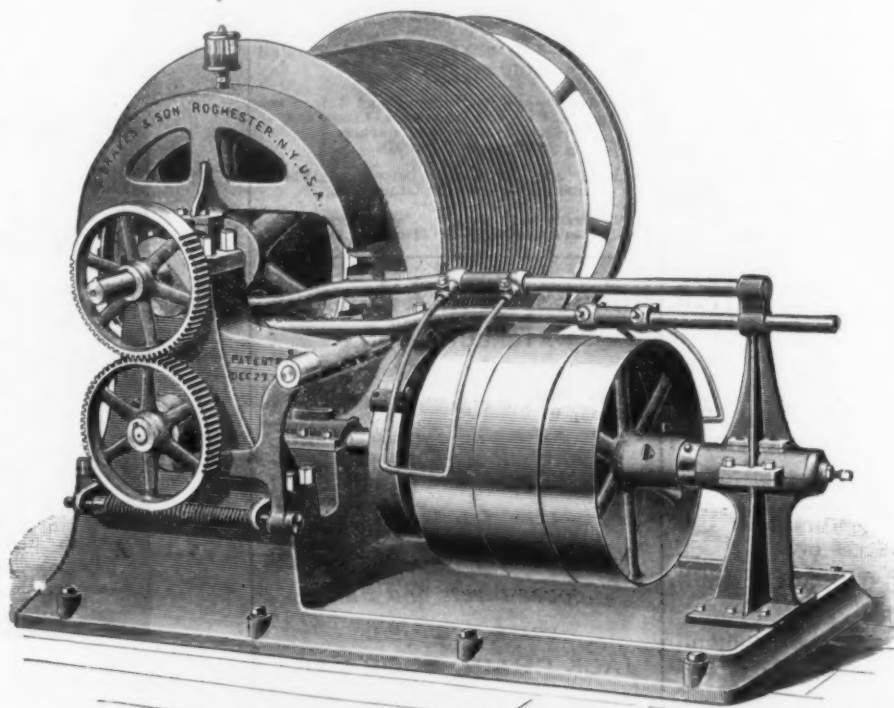


Fig. 1.—Right-Hand Screw Floor Machine.

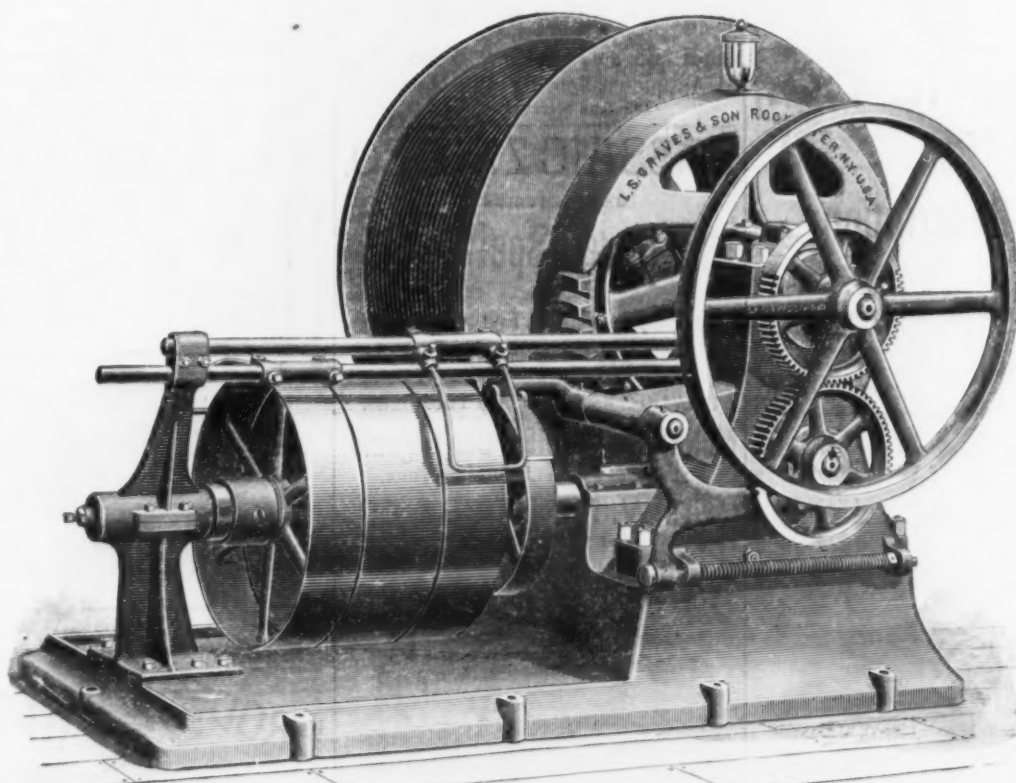


Fig. 2.—Left-Hand Screw Floor Machine.

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nature, but which have stopped short in their development waiting for enterprising strangers to come along and do the work which should be done by their own citizens.

New Forms of Belt Elevators.

It is very desirable in many locations, especially with the heavier class of freight and passenger belt elevators, that the winding machine should set upon the floor or suitable foundation close to the hatchway, which is more accessible and liable to receive much better care and attention than the hanging machine. To meet this want Messrs. L. S. Graves & Son, of Rochester, N. Y., are building several new forms of screw floor machines, two of which we illustrate on this page.

Fig. 2 represents what is known as the No. 10 left-hand machine, a complete, compact and portable apparatus, with all its parts erected and bolted upon a cast-iron bed plate. The screw is cut from a solid

any connection with the shifting or pull rope. It is, furthermore, provided with an improved cable stop, which stops the machine if the cables slack up or are not winding in their proper channel on the drum. In this new design and construction all old patterns have been discarded and many new and valuable improvements have been introduced. The particular machine which we illustrate has a 36-inch drum, and is capable of raising a maximum load of 3000 pounds. The pulleys run at 420 revolutions per minute.

Fig. 1 shows a No. 7 right-hand machine, the hoists being built both right and left hand, the same general design being followed in both forms. The object is to make the machine to fit the different situations of buildings, hatchways, or power necessary to drive it. All sizes of these floor machines are fitted like the No. 10, with patent automatic stop-motion, slack cable stop-motion, which stops the machine should the car meet with any obstruction in its descent, so as to prevent an accident by the

26-inch drum. The shipping weights range from 1800 pounds for the No. 6 to 3000 pounds for the No. 10 hoist.

The London Engineer says that, according to Mr. Stallibrass, the history of deep-sea sounding might almost be said to date from the time of the first Atlantic cable scheme in 1858, but proper attention had not been given to the subject until quite recently. The work of surveying with a view to ascertaining the configuration of the ocean-bed previous to laying a submarine cable was of vital importance. Between Cadiz and Tenerife alone, a distance of about 700 miles, 673 soundings were taken on one expedition, resulting in the discovery of two banks, two coral patches and four other shoal spots. Some of the inclines near these banks were remarkable for their steepness. On the east side of one of these the bottom fell precipitously for 450 feet. On a sounding taken by the Dacia during her survey of the Seine bank a precipice of 1800 feet was found. A

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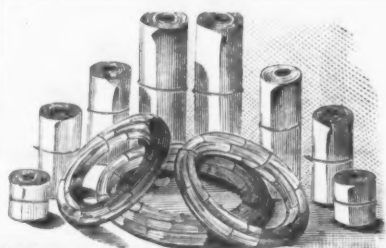
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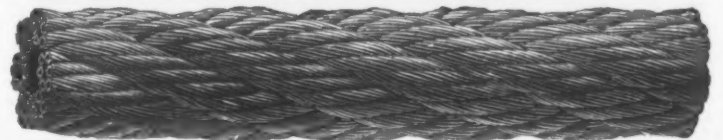
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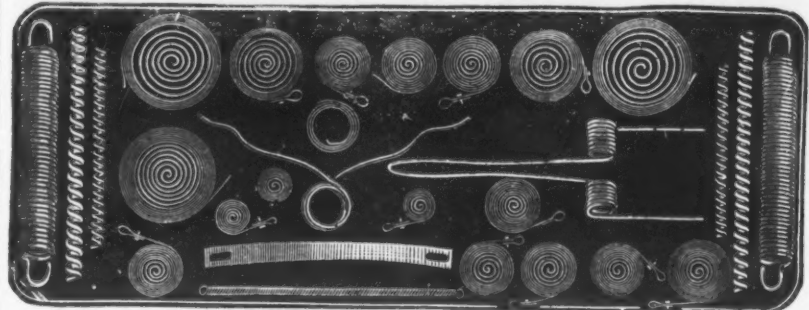
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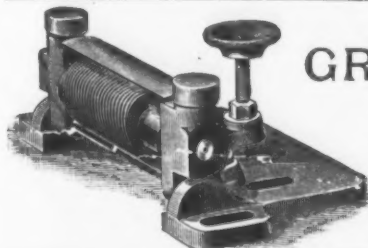


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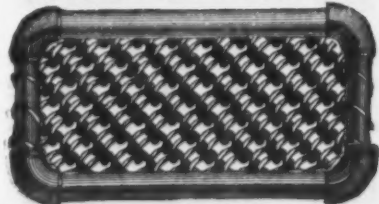
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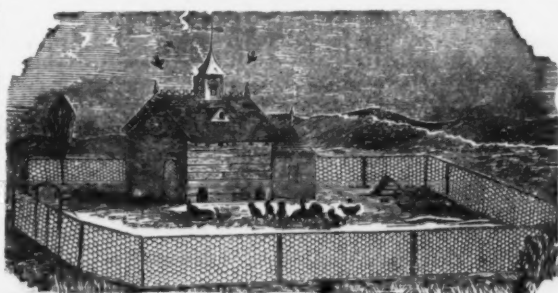
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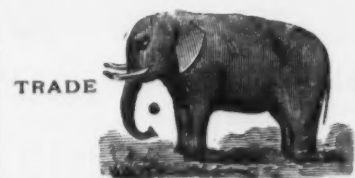
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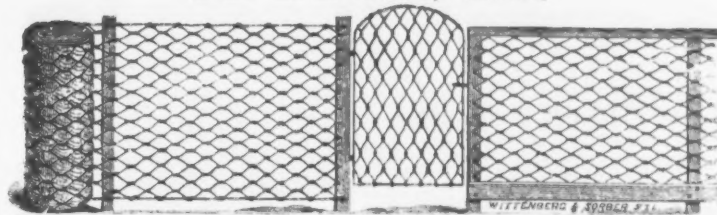


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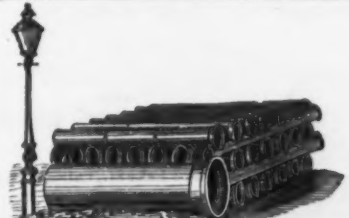
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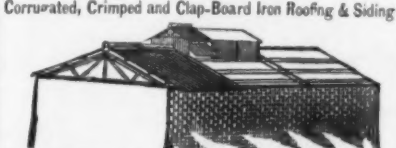
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 Vineland, N. J.

ESTABLISHED IN 1848.
SINGER, NIMICK & CO., Ltd.,
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HAMMERED AND ROLLED

STEEL,

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For Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear-Knives,
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For Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.

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For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws,
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For Boilers, Fire-Boxes, Smoke-Stacks, Tanks, &c.

All our Plate and Sheet Steel being rolled by a Patented Improvement, is unequalled for
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For Shafting, Spindles, Rollers, &c., &c.

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"Iron Center" Cast Plow Steel. | Finished Rolling Plow Coulters, with Patent Screw Hubs
 "Soft Steel Center" Cast Plow Steel. | Agricultural Steel cut to any pattern desired. [attached.
 "Solid Soft Center" Cast Plow Steel. | Steel Forgings made to order.

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MOORHEAD McCLEANE COMPANY,
 Soho Mills, Pittsburgh, Pa., U. S. A.

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SHIP, TANK
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 BRIDGE PLATE,
 SKELP
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 Special Sizes.
 AND
 WIDE SHEETS.

Iron, Steel or
 COMPOUND
**ARMOR
 PLATES,**
 UP TO 18 INCHES THICK.
 GUARANTEED TO STAND
 ADMIRALTY TESTS.
 STEEL OR IRON PLATES
 FOR MERCHANT VESSELS
 OR YACHTS.

Galvanized
 Sheets
 (Patent Levelled).
 Only Manufacturers



And
PLANET BRANDS.

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SHIP PLATE, TANK, BOILER, FLANGE and FIRE-BOX.

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FRANK McKENNA.

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McKENNA, RYAN & SON,
Contractors and Builders,

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 Hot Blast Stoves, Heating Furnaces, Copper Furnaces,
 Annealing Furnaces, Puddling Furnaces, Coke
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Regenerative Furnaces of all kinds.

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STEEL RAILROAD AND MACHINE FORGINGS

SOLID CRUCIBLE STEEL CASTINGS

Best Grades of Tool and Machinery Steel.

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Pittsburgh Wire Nail Co.

Pittsburgh, Pa.

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OLIVER & ROBERTS
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Manufacturers of Steel Wire Nails.

Steel Warehouse, 99 & 101 John Street.

THOMAS C. BURROWS,

AGENT FOR

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(Successors to JAMES R. THOMPSON & CO.)

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CELEBRATED SHEET STEEL.

A full stock of all qualities of Bar and Sheet Steel always on hand.

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MANUFACTURERS OF BLACK AND TINNED NORWAY IRON

RIVETS and BURRS

of Best Quality and Finish.

Prices on Application.

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CUT NAILS, BAR IRON.

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NOW BUILDING A TWO-CONVERTER BESSEMER STEEL PLANT.

GEORGE BROOKE, President.

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Capacity, 1000 Kegs per Day.

Made from their own Pig Iron, Insuring Regularity and Superiority in Quality.

ALSO

FOUNDRY AND FORGE PIG IRON,
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Manufactures
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Extra Fine, Warranted Hand and Bench Tools,
 for Watch, Clock, Piano and Cabinet Makers, Jewelers, Printers,
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MACHINE BOLTS, Track Bolts, Washers, Lag-Screws and Skein-Screws,
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Tacks, Brads, Wire Nails, Shoe Nails, &c., &c.

See the first issue in each month for a more extended list of our manufactures.

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BOAT NAILS,
 Regular and Chisel Pointed; Black and Galvanized.
SHOE NAILS, &c. &c.

Lining and Saddle Nails, 3d. Fine Lath Nails.

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CINCINNATI SALESROOM,
 349 Main St.

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AMERICAN TACK CO., FAIRHAVEN, MASS.

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BOILER TUBES.

Steam, Gas and Water Pipe, Oil
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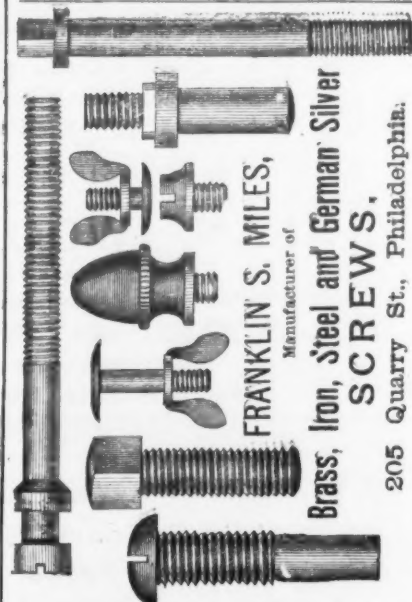
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LINE PIPE.

Cotton Presses, Forgings, Rolling
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FRANKLIN S. MILES,
 Manufacturer of
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COBB & DREW,
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Manufacturers of Copper, Brass and Iron Rivets;
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FOR

Blast Furnaces, Bakers' Ovens, Boiler Flues, Super-
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REVOLUTION INDICATORS,
 Which constantly indicate, without the use of a
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WARDROBE HOOKS.

ONE HOOK
 equal to
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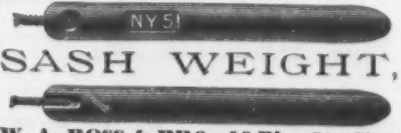
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 Any Garment can be re-
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SUITABLE FOR
 Closet, Hall or Kitchen.
 Price, 25c. each.

Cut this out and ask your
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JAYNE & CROSBY,
 110 Liberty St., N. Y.

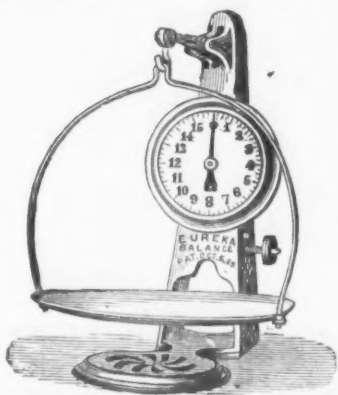
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SASH WEIGHT,

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EUREKA SELF-ADJUSTING SCALES



Have a patented attachment for ascertaining the tare of a dish or other receptacle used in weighing, without the use of weights or loss of time.

Manufactured only by

John Chatillon & Sons,
85, 87 and 89 Cliff St., New York.
Send for Illustrated Price List.

GLASS MYERS' FORCE-PUMP
The most perfect and non-corrosive valve seat, used only in Myers' Pumps.

Adapted to open and drilled wells. The only double acting force-pumps furnished with expansive plunger bucket and Glass Valve-Seat. The only successful Orill Well Pump made.

MYERS' DOUBLE LOCK REVERSIBLE HAY CARRIER.
A perfect reversible carrier. New Myers' iron, steel and wood track carriers. The simplest carriers made. Double and single harpoon hay forks, pileys, hay forks, door and hanging hooks, etc.

F. E. MYERS & BRO., ASHLAND, O.

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MANUFACTURER OF PATENTED

BRASS, BRIGHT

TINNED WIRE

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BIRD CAGES.

The cheapest and most saleable in market. Catalogues and Price Lists furnished to the Trade.

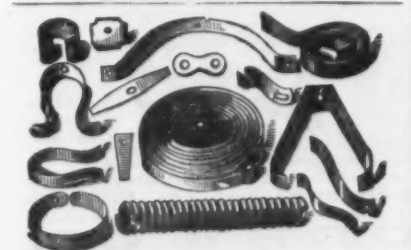
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Full size of Band for Brass and Tinned Wire Cages.

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Manufacturers of
Clock Springs and Small Springs
of every description, from best Cast Steel.
BRISTOL, CONN.

SHELF BOXES
SEND FOR CATALOGUE TO
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The T. H. Bullock, BELLOWS FORGES
The Best for the Money.
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Samuel Martin,
MANUFACTURER OF
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W. & B. DOUGLAS, Middletown, Conn.,

BRANCH WAREHOUSES
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The Oldest and Most Extensive Manufacturers of

Pumps, Hydraulic Rams, Garden Engines,

Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps and Other Hydraulic Machines in the World.

Fig. 120.

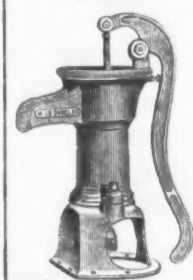


Fig. 200.



Fig. 70.



DOUGLAS' DIAPHRAGM PUMPS.

"LOUD PATENT."

A LARGE CAPACITY, AND EASY WORKING PUMP FOR

Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries,

Fig. 38.



or wherever it is desired to raise a large quantity of water by hand power.

The pump has large valves (accessible by hand) and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

Capacity from 3,000 to 4,500 gallons per hour.

These pumps are simple, durable and low priced. Made either as shown in cut for Hose or for IRON Pipe Suction underneath.

Send for Circular and Price List.

UNION MANUFACTURING CO.

FIG. 114.



Manufacturers of
SKINNER'S PATENT COMBINATION CHUCK.

Plain and Ornamental Butts, Single and Double Acting Spring Hinges, Union Coll Door Springs, Galvanized Pump Chain, Patent Rubber Buckets, Wooden Well Curbs, Wood Tubing, Iron and Brass Pumps, Patent Copper Pumps, Hydraulic Rams, Power Pumps, &c., &c., &c.

FIG. 114 REPRESENTS OUR

Hand Force Pump.

is made of brass, is strong and light, and is the best pump of its kind in the market. Write for prices.

UNION MANUFACTURING CO. New Britain Conn.
Warehouse, 103 Chambers Street, New York.

UTILITY WRENCH WARRANTED.

The New All-Forged and only Adjustable Solid Wrench.



These Wrenches are manufactured of Norway Iron and Steel Forgings, and case hardened. All parts of these Wrenches are warranted. Should any part break it will be made good free of charge on application to the merchant from whom you purchased. Under the greatest strain the sliding jaw will not yield a hair, but remains as firmly fixed as if welded to the bar.

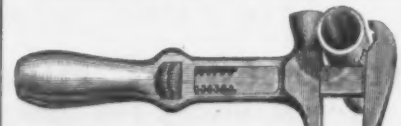
WRITE FOR CIRCULAR AND PRICE LIST.

UTILITY WRENCH CO., LIMITED.

Office: No. 231 E. Ninth St., New York, N.Y., U.S.A. Factory: Hamilton St. & New Jersey R.R. Ave., Newark, N.J., U.S.A.

BOARDMAN'S PATENT COMBINATION WRENCH.

The Most Popular Combination Tool in the Trade.



Made in the most Thorough Manner, of the Best Material and Finish,

By **TOWER & LYON,**

95 Chambers Street, NEW YORK.

RIVERSIDE IRON WORKS,

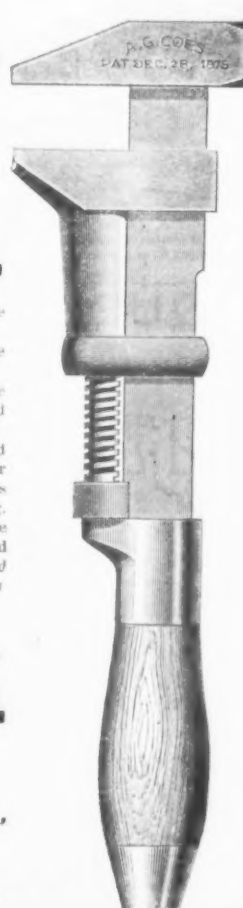
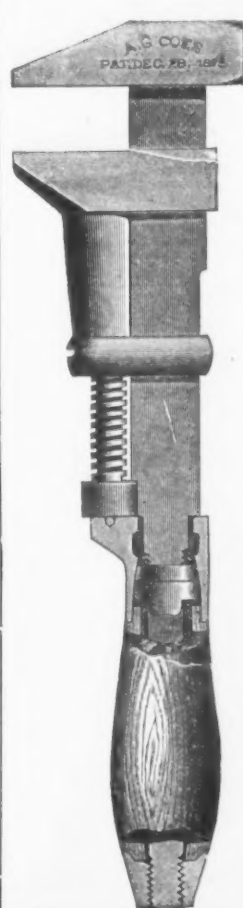
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STEEL NAILS

Fig Iron, Bar Iron, Bar Steel, Steel Blooms, Steel Billets, Small T Rails, Flat Rails of Iron or Steel, Fish Bars of Iron or Steel. WHEELING, W. VA.

Established in 1839.

A. G. Coes & Co.,
WORCESTER, MASS.,
MANUFACTURERS OF
A. G. COES' PATENT SCREW WRENCHES,



The Strongest Wrench made, and the only successful re-enforced bar. The Ferrule is firmly secured in place by a nut screwed on the bar. Particular attention is called to the way in which the handle is made and fastened to the shank. This Handle is made better and stronger than heretofore by using our new Cup Tip at the end which encloses the wood and keeps it from splitting. This is the only wrench which has the wood handle firmly secured and held together at each end, and it will stand more rough usage and last longer than any now made. It is not affected by heat, cold or moisture.

None Genuine unless Stamped,

A. G. COES & CO.

Warehouse:

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JOHN H. GRAHAM & CO., Agts.



Bemis & Call Hardware & Tool Co.

PATENT COMBINATION WRENCH.

Case-Hardened Throughout. Parts Interchangeable.

This Wrench not only combines the superior qualities of a Gas Pipe Wrench but also all the requisite requisites of a regular Nut Wrench, thus making a combination which has no equal.



No. 3 PATENT PIPE WRENCH.

The serrated jaw of the Wrench are interchangeable; that is, the same serrated plate may be used for either the stationary or sliding jaw, so that if one plate is broken another can be furnished adapted to either jaw without express designation. The slides, nuts and various parts are also interchangeable, thus easily repairing the Wrench at very small expense, and with as perfect practicability for further use as when the Wrench was new. For Circulars and Price List, address

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WHAT A PROMINENT PHILADELPHIA GENTLEMAN SAYS OF THE NEW YORK SAFETY DUMB WAITER FIXTURES:

1511 Spruce St., Philadelphia, Pa., Nov. 30th, 1887.

The Edward Storm Spring Co., Limited, Poughkeepsie, N. Y.:

Gentlemen:—Your Safety Dumb Waiter that I substituted some time ago for an old one gives great satisfaction. We feel now that our dishes can make the trip between floors in safety, which we never could do before, as the old waiter appears to have been constructed in the interest of the china and glass dealers, and I am sorry to say was only too successful in furnishing them business. A good dumb waiter for family use is much needed, and yours is the best that I have seen. If my recommendation is of any value to you, use it.

Yours respectfully,

JOSEPH S. PATTERSON.

SOLD BY THE HARDWARE TRADE GENERALLY.

JOHN H. GRAHAM & CO., Mfrs. Agents,

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STAR BRAND TACKLE BLOCKS,
For Railways, For Contractors, For Bridge Builders and General Trade.



We would particularly call attention to our Self-Adjusting Five Roll Roller Bush Blocks which for strength and durability cannot be equalled by any other make. These Roller Bushed Blocks give twice the purchase of the Iron Bushed Blocks, and are far more preferable to use on account of greater ease in hoisting. Try them and find out for yourselves. Call for the "Star Brand" SELF-ADJUSTING FIVE ROLL ROLLER BUSH BLOCKS.

BAGNALL & LOUD BLOCK CO.,

162 Commercial Street, Boston, Mass.



SOUTH BEND PUMP CO.,
Manufacturers of Wood Pumps, Tubing, &c.

"Magic" and "Standard" Saw Bucks FOR THE JOBBING TRADE.

SOUTH BEND PUMP CO., So. Bend, Ind

Paris, 1878. **McCAFFREY & BRO.,** For Superiority.
PENNSYLVANIA FILE WORKS,
 PHILADELPHIA, PA., U. S.

Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade. Superiority acknowledged wherever used, sold or exhibited.

QUEEN ANNE SCREEN CO.,
 MANUFACTURERS OF

THE IMPROVED

Adjustable Queen Anne Screen



This is a new departure in adjustable screens and is free from many objections found in others. It is the **only double face screen**, and **equally well finished on both sides**. It has a **box panel**, and can be adjusted **without the friction** noticeable in all other adjustable screens. This screen is made either of soft or hard wood, and stained imitation black walnut, cherry, or finished in natural wood, as desired.

Price Lists and Discounts furnished on application to

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LIGHTNING HAY KNIVES
 WEYMOUTH'S PATENT.

This Knife is the **BEST IN USE** for cutting down hay and straw in mow and stack-cutting fine feed from bales, cutting corn stalks for feed, cutting peat & ditching marshes. The blade is **Best Cast Steel**, spring temper, easily sharpened, and is giving **universal satisfaction**. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and it seems destined to take the place of all other Hay Knives. They are nicely packed in boxes, 1 dozen each of 60 pounds weight, suitable for shipping by land or water to any part of the world. Manufactured only by
HIRAM HOLT & CO., EAST WILTON, Franklin Co., MAINE.
 For sale by the Hardware trade generally.

CAUTION.

We are informed that various parties are infringing upon the widely-known Letters Patent granted originally to GEORGE F. WEYMOUTH for an improved Hay Knife. The invention patented to GEORGE F. WEYMOUTH is embodied in a sword-shaped blade provided with operating handles for working the same, the edge of the sword-blade being furnished with knife-edged serrations or teeth. **IT IS OUR PURPOSE TO PROSECUTE ALL INFRINGEMENTS**, and to hold responsible to the full extent of our ability and of the law all parties who manufacture any knife infringing upon the patent, or who deal in the same. Several suits are now pending in the U. S. Courts. **All manufacturers and dealers are hereby warned of our rights, and the public are cautioned against purchasing any Hay Knives, made as described above, which are not of our genuine manufacture.**
 EAST WILTON, Sept. 1, 1886.



W.H. CARTER'S PATENT NEEDLE HAY KNIFE.

PAT. APR. 29, 1884.
 IMPROVED BY M.M. BARTLETT.
 Improvement Patented April 28, 1885.

NEEDLE HAY KNIFE, THE BEST IN THE WORLD.

Improvement patented April 28, 1885, of which we are the sole manufacturers, has been tested with the most celebrated knives of other makers, and has proved an easier and faster Cutter than any other. Its special excellence consists in the chisel-edge tooth shown in the engraving. It may be used for cutting hay in the mow, stack and bale; also for ditching, cutting peat, or any other work for which a hay knife is used. It can be readily ground by the most inexperienced, as it requires to be ground only on one side. Should a tooth break, all that is necessary to replace the damage is to grind it once and a new chisel-tooth appears. It can ordinarily be sharpened with a common scythe stone. Try one and you will give it the preference.

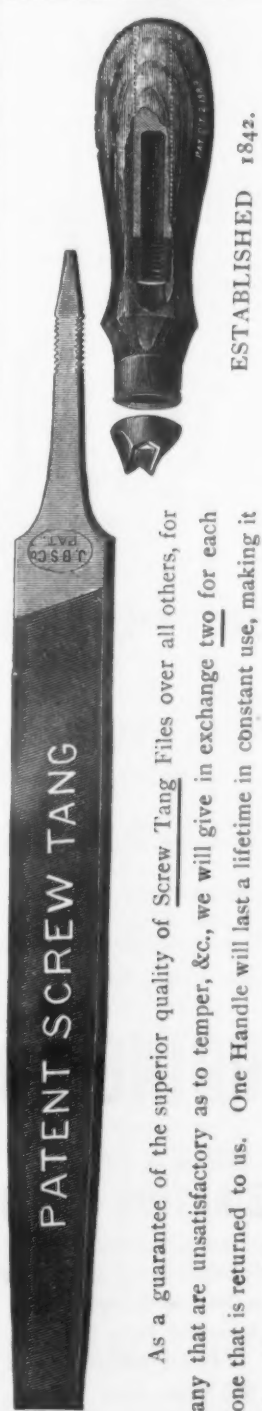
A NEW DEPARTURE!

The Smith & Wesson Hammerless, Safety REVOLVER



Calibres 32 and 44 in Preparation. Provided with Automatic Shell Extractor Rebounding Lock. The Latest Production from the Works of SMITH & WESSON, Springfield, Mass. Manufacturers of Superior Revolvers, both Double and Single Action.

Absolute Protection from Accidental Discharge Insured. Superiority in Every Point Universally Conceded. SEND FOR DESCRIPTIVE CIRCULAR.



PATENT SCREW TANG

As a guarantee of the superior quality of Screw Tang Files over all others, for any that are unsatisfactory as to temper, &c., we will give in exchange **two** for each one that is returned to us. One Handle will last a lifetime in constant use, making it the cheapest Handle in the world. Cost 10 cents each.

J. BARTON SMITH CO.,
 Philadelphia, Pa., U. S. A.

GILBERT PARKER, President.

BLACK DIAMOND FILE WORKS.



G. & H. BARNETT,
 21 to 43 RICHMOND STREET, - - - PHILADELPHIA.

CHARLES B. PAUL, MANUFACTURER OF HAND CUT FILES,

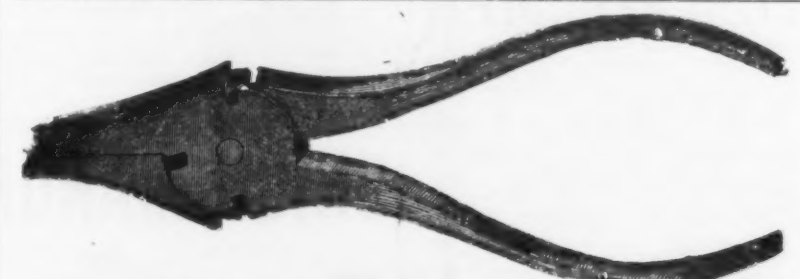
Warranted Cast Steel. 467 Keap St., Brooklyn, N. Y.
 All descriptions of Files made to order. Price List mailed on application. Established 1863.

EXCLUSIVELY **HAND-CUT** FILES and RASPS

MANUFACTURED BY THE
CHELSEA FILE WORKS, NORWICH, CONN.



The superiority of our Horse Rasps over all others is universally admitted by those who use them, and their high degree of excellence will be scrupulously maintained. Give them a trial, and use no others.



J. M. KING & CO.,
 WATERFORD, N. Y.

Manufacturers of the

Button's Pat. Wire Cutter and Plier Combined.

Specially Adapted for Use on Wire Fence.

Also Manufacturers of BLACKSMITHS' STOCKS and DIES, PLUG and TAPER TAPS, HAND, NUT and SCREW TAPS, PIPE TAPS and REAMERS.
 Price List on Application. Established by DANIEL B. KING, 1830.

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BEST IN THE WORLD.



THE ONLY SIFTER in the market which can be operated with **one hand**. It does not grind impurities through the wire cloth, like other sifters. With one hand grasp the Wooden Handle (do not touch any other part) and then shake the sifter sideways.

Illustrated Price List containing all goods of our manufacture supplied on application.

Sidney Shepard & Co.,
 BUFFALO, N. Y.
C. Sidney Shepard & Co.,
 CHICAGO, ILL.

THE EMPIRE METAL SPIRIT LEVEL, WITH DOUBLE PLUMB.

Glasses are Immovable. No Parts to Work Loose. Glasses Perfectly Protected. Made Entirely from One Piece.



The Most Durable, Simple in Construction and Cheapest Iron Level on the Market. Manufactured by **GREENE, TWEED & CO., 83 Chambers St., New York.**

E. W. GILMORE & CO.,
 NORTH EASTON, MASS.

Strap and T Hinges,

CRATE HINGES AND HASPS,

Ship Scrapers, Iron Washers.

BRAIDED WIRE PICTURE CORD,

Tinned, Gilt and Gold, put up in small round boxes of 25 yds. and 25 feet, warranted full length; cord pulled out through hole in center of box.

SEND FOR PRICES.

TOWER & LAMONT,

MANUFACTURERS OF **RAZOR STROPS,** Rochester, N. Y.



The LAMONT is the original Combination Strop and the Standard. It positively has no equal. If your jobber does not have it, send to us. Best of Russia leather.

This Knife has been thoroughly tested and proven superior to any other.

—THE—
AMERICAN SICKLE EDGE HAY KNIFE.

It will cut loose or packed hay, straw, peavines, etc., for feed, from stack, mow or bale, faster and with less labor than any other knife.

SPECIAL FEATURES AND ADVANTAGES.

The blade is made in sections, and can be easily replaced with new sections if any are broken or damaged. Is easy to sharpen; has handle to suit right or left-hand persons; finely finished in vermilion and gold bronze. For sale by the Hardware trade generally.

MANUFACTURED BY

The Ney Manufacturing Co.,
 CANTON, O.

Chapman Valve Mfg. Co.,

MANUFACTURERS OF

VALVES AND GATES

—FOR—

Water, Steam, Gas, Ammonia, &c.

GATE FIRE HYDRANTS,

with and without

INDEPENDENT NOZZLE VALVES.

All Work Guaranteed.

Works and General Office,

INDIAN ORCHARD, Mass.

Treasurer's Office,

72 Kilby and 112 Milk Streets,

BOSTON, Mass.

CARRIAGE HARDWARE.

LARGEST LINE OF

WROUGHT CARRIAGE FORGINGS.

MADE BY ANY HOUSE

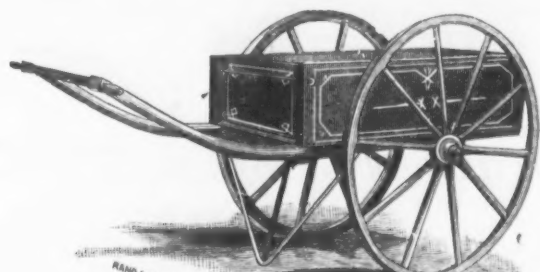
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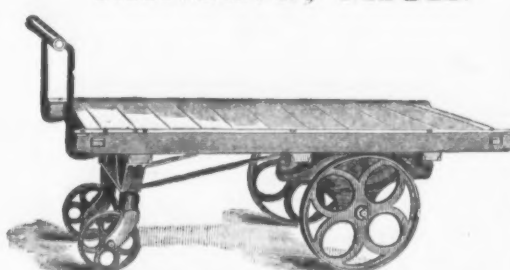
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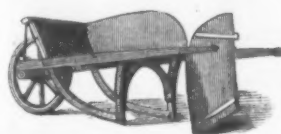


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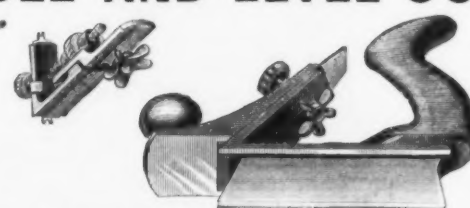
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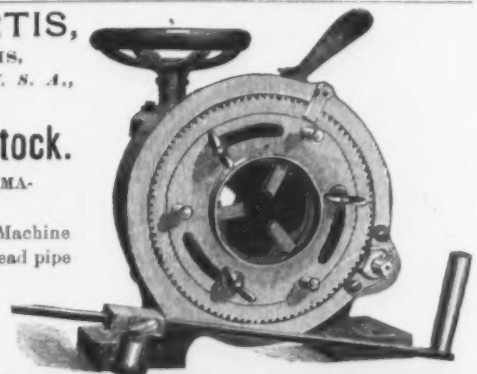
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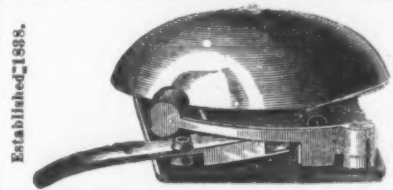
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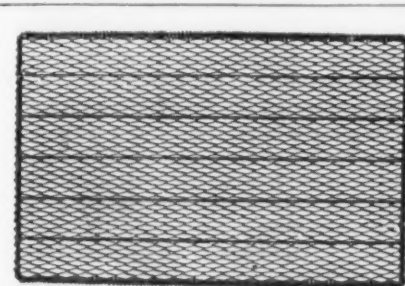
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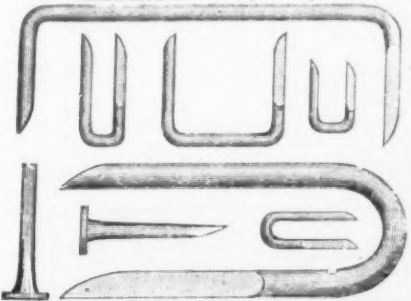
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are much Stronger, Lighter, more Durable and Cheaper
than all others taking same size rope? No extra
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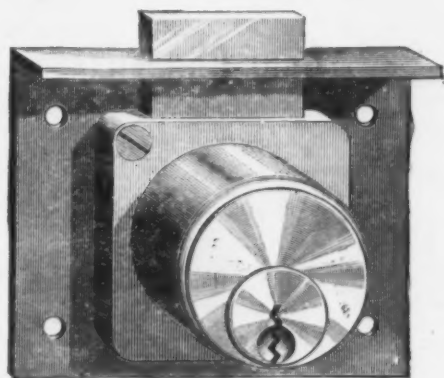
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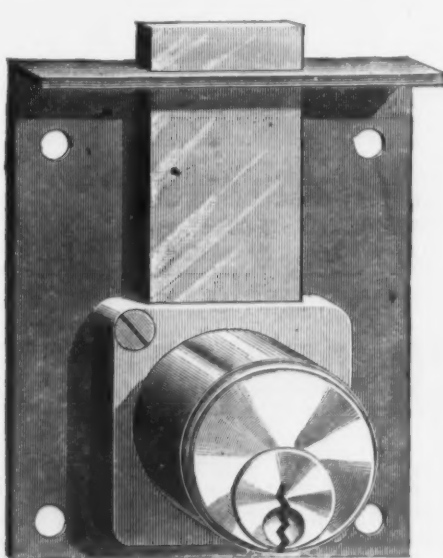
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New Southern Coke Furnaces—III.

In our last issue we described the plant of the Sheffield Furnace Company, which is furthest advanced. At the same point three furnaces are being built by the

SHEFFIELD AND BIRMINGHAM COAL, IRON RAILWAY COMPANY,

from the plans of Messrs. Gordon, Strobel & Laureau, of Philadelphia. The furnaces are 75 feet high by 18-foot bosh and 9-foot crucible, blown through seven tuyeres. Each is equipped with three Gordon-Whitwell-Cowper hot-blast stoves, 20 feet in diameter and 65 feet high. The down-comer is 6 feet 4 inches in diameter, the dust-catcher being 11 feet 9 inches in diameter and 18 feet high. The furnaces have seven Gordon engines, with 36-inch steam cylinder and 4-foot stroke. They are furnished with steam by 12 Babcock & Wilcox boilers, each of 156 horsepower. The three draft stacks for the boilers are 110 feet high; the casthouses are 150 x 50 feet, and the stockhouse 82 x 400 feet. It will require until June 1, 1888, to complete the first furnace, and until August of the same year to complete the others, the estimated capacity of each being 140 tons.

LADY ENSLEY FURNACE,

at Sheffield, which is being built by James P. Witherow, is 75 feet high by 17 foot bosh, 9-foot crucible, 9 foot bell and a diameter of 13 feet at the stock line. It is to be blown through eight tuyeres. The furnace will have three improved Whitwell stoves with central combustion chamber, 18 feet in diameter by 50 feet high. The down-comer is 6 feet in diameter, and has a 12 foot dust-catcher 18 feet high. The casthouse is 50 x 150 feet. The furnace is equipped with two Dickson engines, having 36-inch steam cylinders and 84-inch blowing cylinders and 4-foot stroke. Steam is furnished by three Heine boilers, with 113 tubes 16 feet long in each. The draft stack will be 160 feet high by 18 feet in diameter in the clear, while the stockhouse is to be made 75 feet by 150 feet. The capacity of the furnace is rated at 125 tons, but as yet it is impossible to state when it will be completed.

The North Alabama Furnace, Foundry and Lard Company are building one of the

TWO FURNACES AT FLORENCE,

their plant differing in many respects from that of the majority of the Southern furnaces. Florence is located on the Tennessee River, opposite the newer town of Sheffield. The furnace is 75 feet high by 16-foot bosh, with 8 foot crucible, and 8 feet diameter of bell, blown through six tuyeres. It is equipped with a 7-foot down-comer, having a dust-catcher 7 feet in diameter and 10 feet high. In front of the furnace is the cast-house, 60 x 90 feet, while partly back of it, extending to the left, are the three Pollock improved iron-pipe stoves. It will be seen, therefore, that this is the only recent furnace in the South which has adopted iron stoves. Back of the furnace is the engine-house, in which are two engines built by the Columbus Machine Company, of Columbus, Ohio, the engines having a 40-inch steam cylinder, 84-inch blowing cylinder and a 4-foot stroke. Directly back of the stoves are four batteries of two flue boilers each, 52 inches in diameter and 30 feet long. Each battery has a draft stack 66 feet high. Alongside of the furnace extends the stock-house, 75 x 200 feet. The hoist has not yet been purchased. The capacity of the furnace is rated at 100 tons per day, but it is not expected that it will be blown in before June or July, 1888. Two weeks since a contract was made by the

W. B. WOOD FURNACE COMPANY, of Florence, Ala., with Messrs. Gordon, Strobel & Laureau, for a furnace 75 feet high by 18 feet bosh. This furnace, of course, cannot be expected to be in operation before the latter part of 1888.

In addition to the furnaces enumerated there are a few under construction concerning which we have not received details. They are enumerated with those already referred to in the following summary:

New Southern Furnaces.

| | |
|---|----|
| Alabama: | |
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| Bessemer, De Dardelben Coal and Iron Company, Birmingham | 2 |
| North Birmingham, Bloss Iron and Steel Company, Birmingham | 2 |
| Ensley, Tennessee Coal, Iron and Railroad Company, Birmingham | 4 |
| Trussville, Birmingham Furnace and Mfg. Company, Birmingham | 1 |
| Sheffield Furnace Company, Sheffield | 1 |
| Lady Ensley, Lady Ensley Furnace Company, Sheffield | 1 |
| Sheffield and Birmingham Coal, Iron and Railroad Company, Sheffield | 3 |
| Florence, North Alabama Furnace, Foundry and Sand Company, Florence | 1 |
| Wood, W. B. Wood Furnace Company, Sheffield | 1 |
| Gadsden Furnace, Gadsden | 1 |
| Woodstock, Woodstock Iron Company, Aniston | 2 |
| Total Alabama | 20 |

| | |
|---|---|
| Tennessee: | |
| South Pittsburgh, Tennessee Coal, Iron and Railroad Company | 1 |
| Dowling Furnace Company, Chattanooga (just decided upon definitely) | 1 |
| Total | 2 |

| | |
|---|---|
| Virginia: | |
| Pulaski, Pulaski Iron Company, Pulaski | 1 |
| Lynchburg, Virginia Nail and Iron Works Company, Lynchburg (building 12 1/2 x 60) | 1 |
| Total | 2 |

This is a total of 24 modern furnaces, of which 22 are in various stages of progress, two having just been begun. What their aggregate capacity will be it is impossible to state, because in the case of only two many of them the working of the ores and fuel to be used in them is unknown. We question whether they will average much more than 80 tons each daily, which would make the aggregate 1920 tons a day, or considerably over 500,000 tons annually.

CORRECTION.

By the misplacement of a line the first part of the description of the four Ensley furnaces in the second installment of our article "New Southern Coke Furnaces," December 15, page 13, has become unintelligible. The introduction should read: "In The Iron Age of November 3 we described in

detail the plant of the four Ensley furnaces, the principal characteristic of which is the introduction into the Birmingham district of furnaces larger than those used hitherto—viz., 80 feet high by 20 feet bosh. Work is actively going on in building."

The Coke Syndicate Dissolved.

The coke syndicate, which has been in existence since 1884, and which controlled the output of the Connellsville region and fixed the selling price of coke, has been finally dissolved, and the members of the Producers' Association have been released from all contracts. This important action was taken at a meeting of the syndicate held at its headquarters, in Pittsburgh, on the 10th inst. At this meeting a number of the members of the Producers' Association were in attendance and asked to be released, and after a long discussion it was decided to grant their request. This action ends the existence of the syndicate, and leaves every operator in the region, be he large or small, free to dispose of his coke on his own terms. When the syndicate was formed the price of coke through keen competition had been reduced to 95 cents per ton. Immediately on the foundation of the syndicate it commenced to advance until the price reached \$2 per ton. Whether this high price can be maintained is now an open question. While it is true that there is a brisk demand for coke, and that it is difficult to secure transportation for coke sold at present rates, still, on the other hand, it is quite probable that concessions will be made by the former members of the Produce Association in order to secure a trade for their product. It is stated that the main reason the producers advanced for wishing to be released from the syndicate was the failure of that body to distribute the cars on a satisfactory basis. Many of the operators were unable to run their plants more than half time, while others were compelled to stock their coke in the yards, which of course, added greatly to the cost. One of the reasons advanced for the scarcity of cars is the fact that the Ohio River has not been navigable for months, and that coal formerly shipped by river to Southern points has to be forwarded by rail, thus taking away from the region rolling stock which would otherwise be used in hauling coke. A member of the syndicate who was present at the meeting made the following statement as to the probability of the price of coke being reduced in the near future: "That was the last meeting of the syndicate, and unless an organization is effected within a month, to prevent cutting prices, it may result in open competition in the market, and that means low prices and small wages. Just now the chances are even either way. The producers were offered \$2 to-day for from 3000 to 5000 carloads, and although they seemed so anxious to do business the offer was not accepted. I do not see how any immediate cutting can take place, as the market is to-day 10,000 carloads short and it is impossible to get cars to fill the demand. All the coke that can be shipped can find a ready market for some time, so there is no need of cutting. The syndicate, however, is finally dissolved and will never hold another meeting. Should any be called it will be by outsiders, as there is no central authority now existing by which one can be convened."

Latest Customs Decisions.

Carpenters' and smiths' pincers, pliers, hand-vices, nippers, compasses, auger bits, and also corkscrews, nut-crackers, all of which upon investigation are found to have been manufactured of iron and steel by a process of forging or hammering to the shape required for their further manufacture, and to be welded with steel where required and then ground, filed, smoothed and polished, are held, inasmuch as they are not specially enumerated, to be dutiable at the rate of 45 per cent. ad valorem for "manufactures, articles or wares not specially enumerated or provided for, * * * composed wholly or in part of iron [or] steel." Such articles cannot be classified under the provision in said schedule for "forgings of iron and steel."

Eyetelets for shoes, consisting of small brass rings intended to be set into the uppers of gaiter shoes for the purpose of lacing them, cannot be considered as buttons either by assimilation or otherwise, and, being otherwise unenumerated, are held to be dutiable at the rate of 45 per cent. ad valorem for "manufactures, articles or wares not specially enumerated or provided for, * * * composed wholly or in part of * * * metal."

It is held that on the importation of so-called silver ore containing copper, the copper is dutiable at the rate of 2 1/2 cents per pound, as copper in the form of ores which shall pay a duty of 2 1/2 cents per pound.

Molding sand, so-called, which upon investigation was found to be imported in the crude state, is held to be exempt from duty, under the provisions of the free list, for "crude minerals, not advanced in value or condition," &c.

On the exportation of ingot copper extracted from imported sulphur ores, which ores pay duty at the rate of 75 cents per ton on the total weight and 2 1/2 cents per pound on the pure copper contained therein, drawback can only be paid at the single rate of 2 1/2 cents per pound on the pure copper, less the legal retention of 10 per cent., and no return of any portion of the duties of 75 cents per ton should be made.

Foreign materials used in the construction of the United States shore end of an international bridge are liable to duty, but materials used in the construction of such bridge up to the shore end are exempt.

The Boston Herald says that Lackenby pig can be laid down at Boston for \$20.50, when Eglington is quoted there at \$21.50 @ \$22 and Coltness \$23 @ \$24.

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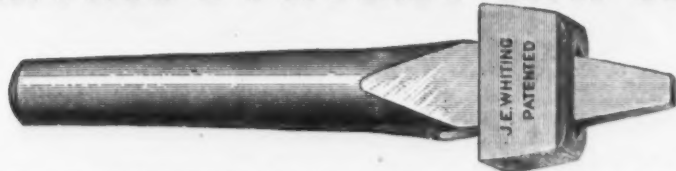
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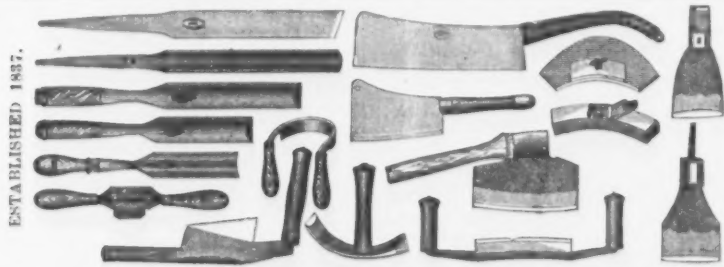
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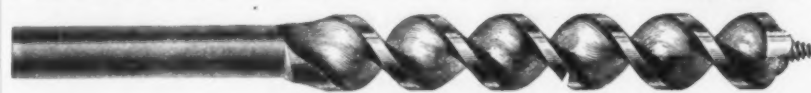
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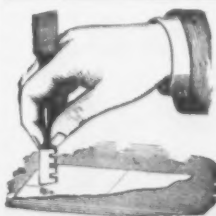
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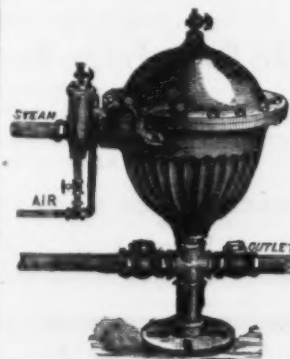
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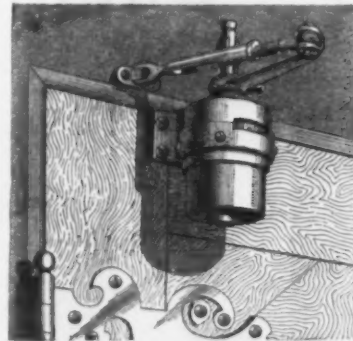
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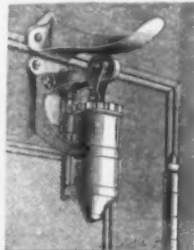
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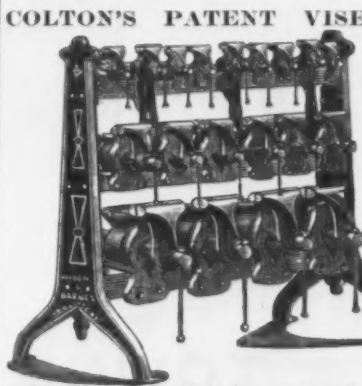
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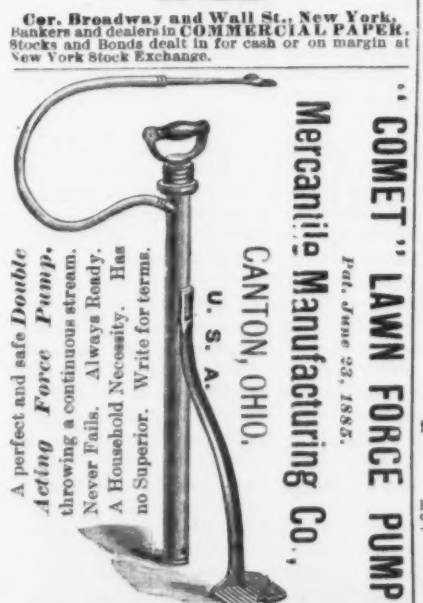
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The Use of Aluminium in the Manu- facture of Steel.

Mr. John W. Spencer, proprietor of the
Newbern Steel Works, Newcastle-on-Tyne,
has sent the following report to the Cowles
Electric Smelting and Aluminium Company,
of Lockport and Cleveland:

GENTLEMEN—I beg to inclose results of
experiments on the use of aluminium in the
manufacture of steel castings, with the
chemical and mechanical tests of the same.
In conducting the experiment, I had chiefly
in view the effect of aluminium on the pre-
vention of blow-holes, the mechanical test
being subordinate though important. I
therefore used in the melting mixtures of
steel, such as come to hand, as would be
done in a usual way, and in the production
of ordinary steel, as distinguished from
"steel castings," and the methods used to
insure soundness in them. The result has
been satisfactory in every instance so far as
soundness and the usual attributes of a good
casting are concerned, running fluid and
without ebullition into sharp, clear castings,
the milder mixtures, when tried by the ham-
mer test, breaking very strong though un-
annealed.

The chemical reaction of the aluminium in
the crucible in presence of other combina-
tions may be various, but reducing the car-
bonic oxide and preventing blow-holes is the
chief desideratum. In clay-pots the alumi-
num may react upon the silica, reducing it,
the silicon going into the steel, especially in
the presence of high carbon, which itself
generally increases the silicon contents in
the steel made in ordinary crucibles. The
present experiments, however, have not
been conducted with that nicety to enable
a scientific analysis being made of the various
reactions taking place in the different mix-
tures, but it will be observed in looking over
the analyses that there is a marked increase
of silicon in presence of the higher percent-
age of aluminium and carbon. All the low
carbon, A 1, 4, 10, 13, were obtained by
using Swedish iron altogether, as also A 7,
14, 15; though A 7, with carbon 0.28 per
cent. has a tensile strength of 25.53 tons per
square inch, as against A 15 with carbon
0.29 per cent. and 23.62 tons tensile strength
it may be said that aluminium has increased
the elastic limit and tenacity 2 tons; but it
will be noticed that silicon is 0.22 per cent.
in the former and only 0.074 per cent. in the
latter, which may partly account for the dif-
ference. Unfortunately several of the speci-
mens for mechanical test have had slight
flaws on the outside or circumference of
fracture vitiating the result for strict com-
parison, yet the elastic limit remains to en-
able an estimate to be formed. The general
conclusion as regards the mechanical test is
that, though possibly aluminium may in-
crease the tensile strength and the elastic
limit slightly, yet this is done at the expense
of ductility, and, in comparison with our
usual steel castings, a copy of tests whereof
is annexed, I do not find that there is any
advantage in its use for increasing the
strength and ductility of steel castings, but,
on the contrary, I think that in presence of
high carbon it is disadvantageous in this re-
spect. It will be found that neither the
elastic limit nor tenacity are in any case
more than can be accounted for by the car-
bon and silicon present. In fact, I have
been astonished that they have come out so
low.

Some of the carbons are higher than I in-
tended, A 6 and 9, owing to the melter not
having allowed for carbon in the alloy, but,
as all the analyses as well as the mechanical
tests are given, a general comparison can be
made. I am having another mixture made
in place of A 15, also caused by error of the
melter in mixing, and also one of the same
material, but without any aluminium.
The first mixtures, A 1, 2, 3, were cast
into casting only without any mechanical
test-pieces being taken. In A 4 to 9 the
steel castings had all been annealed, accord-
ing to usual practice, before it was thought
that unannealed test pieces would have been
desirable as well as annealed. A 10 to 15
had tests made from both unannealed as
cast, and also from annealed. The effect of
the annealing may be interesting to you.
Inclosed are tables of analysis and mechan-
ical tests, together with analysis of the alloy
used. (Signed) JOHN W. SPENCER.

Chemical Analysis of Aluminium Alloy. Dated
June 14, 1887.

| | Per cent. |
|----------------------|-----------|
| Iron..... | 86.69 |
| Carbon combined..... | 1.01 |
| Graphite..... | 1.91 |
| Total..... | 2.92 |
| Silicon..... | 2.40 |
| Manganese..... | 0.31 |
| Aluminium..... | 6.50 |
| Copper..... | 1.05 |
| Sulphur..... | 0.004 |
| Phosphorus..... | 2.13 |
| Total..... | 103.00 |

N. B.—This aluminium iron was shipped by
the Cowles Electric Smelting and Alumi-
nium Company to England in December,
1886, and was from about the first run they
ever made of this product. The high per-
centage of copper is very objectionable,
perhaps fatal to increased strength and
ductility, and was caused by running the
iron in electrical furnaces where formerly
copper had been worked. The percentage
of aluminium is very much lower than what
they now attain.

Materials used.

| Mixture. | Swedish iron. | Spring scrap. | Alloy. | Chemical composition. Percentage of. | | | | | |
|----------|---------------|---------------|--------|---|---------|-------|-------|-------|-------|
| | | | | C | Mo | Si | Al | S | P |
| A 1 | 56 | 1 | 1 | 0.12 | traces. | 0.074 | 0.11 | 0.019 | 0.051 |
| 10 | 55 | 1 | 1 | 0.10 | ..... | 0.06 | 0.12 | 0.015 | 0.04 |
| 13 | 55 | 1 | 1 | 0.15 | ..... | 0.068 | 0.12 | 0.013 | 0.037 |
| 14 | 55 | 1 | 1 | 0.25 | 0.045 | 0.058 | 0.12 | 0.013 | 0.037 |
| 15 | 56 | 1 | 1 | 0.29 | traces. | 0.074 | 0.11 | 0.013 | 0.037 |
| 4 | 56 | 2 | 2 | 0.15 | traces. | 0.084 | 0.19 | 0.013 | 0.038 |
| 7 | 56 | 4 | 4 | 0.28 | ..... | 0.22 | 0.35 | 0.012 | 0.053 |
| 2 | 56 | 1 | 1 | 0.21 | 0.16 | 0.11 | 0.035 | 0.051 | 0.040 |
| 11 | 56 | 1 | 1 | 0.21 | 0.09 | 0.094 | 0.026 | 0.04 | ..... |
| 5 | 56 | 1 | 1 | 0.15 | ..... | 0.33 | 0.09 | 0.14 | 0.032 |
| 8 | 56 | 4 | 4 | 0.19 | 0.10 | 0.23 | 0.023 | 0.049 | ..... |
| 3 | 56 | 1 | 1 | 0.58 | 0.25 | 0.28 | 0.11 | 0.05 | 0.062 |
| 12 | 56 | 1 | 1 | 0.48 | 0.30 | 0.33 | 0.11 | 0.037 | 0.045 |
| 6 | 56 | 2 | 2 | 0.55 | 0.25 | 0.28 | 0.14 | 0.035 | 0.054 |
| 9 | 56 | 4 | 4 | 0.85 | 0.30 | 0.40 | 0.25 | 0.028 | 0.055 |

| MIXTURES. | | | | | Chemical analysis. | Mechanical tests. | | | Flaw in per cent. of area with indication of position.* | | |
|-----------|----|----|-----|------------|---|-----------------------------|--------------------------------|-----------------------|---|--------------------|--------|
| A | Al | C | Si | Mark. | Elong. limit, gross tons per square inch. | Maximum strain, gross tons. | Contraction of area, per cent. | Elongation, per cent. | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| As cast. | | | | | | | | | | | |
| 10 | 12 | 10 | 06 | 1189 11 2 | 32 | 81 | 37 | 1 | 25 | See note. | |
| 13 | 12 | 15 | 063 | 1191 11 6 | 32 | 81 | 37 | 1 | 29.5 | | |
| 11 | 12 | 15 | 063 | 1165 14 4 | 32 | 80 | 39 | 73 | 36.5 | | |
| 11 | 12 | 21 | 063 | 1166 11 9 | 32 | 8 | 37 | 15 | 25 | | |
| 14 | 12 | 25 | 063 | 1191 11 9 | 35 | 28 | 14 | 48 | 13 | | |
| 14 | 12 | 25 | 063 | 1192 13 30 | 78 | 14 | 48 | 12 | 15 | | |
| 14 | 12 | 25 | 063 | 1192 12 32 | 23 | 7 | 84 | 6 | 4.2 | | |
| 15 | 11 | 29 | 071 | 1190 11 9 | 32 | 34 | 11 | 10 | 2.7 | | |
| 15 | 11 | 29 | 071 | 1189 9 9 | 22 | 81 | 12 | 02 | 7 | 15 (o) | |
| 17 | 11 | 48 | 33 | 1193 | — | 17 | 08 | — | — | 8 see note, 40 (o) | |
| 17 | 11 | 48 | 33 | 1194 | — | 18 | 19 | — | — | | |
| Annealed. | | | | | | | | | | | |
| 10 | 12 | 10 | 06 | 121 | 9 | 72 | 30 | 48 | 60 | 1 | 38 |
| 13 | 12 | 15 | 063 | 1209 | — | 9 | 72 | 31 | 16 | 30 | 33.7 |
| 13 | 12 | 15 | 063 | 1207 | 9 | 96 | 20 | 44 | 61 | 36 | 38 |
| 11 | 12 | 21 | 063 | 1208 | 9 | 90 | 20 | 33 | 64 | 66 | 38 |
| 11 | 12 | 21 | 063 | 1203 | 10 | 02 | 24 | 06 | 50 | 39 | 23.5 |
| 11 | 12 | 21 | 063 | 1204 | 10 | 47 | 13 | 32 | 14 | 34 | 31 |
| 14 | 12 | 25 | 063 | 1210 | 9 | 80 | 22 | 35 | 52 | 34 | 31 |
| 14 | 12 | 25 | 063 | 1210 | 9 | 47 | 12 | 35 | 56 | 11 | 32.5 |
| 15 | 11 | 29 | 071 | 1211 | 9 | 55 | 33 | 6 | 34 | 9 | 24.5 |
| 17 | 12 | 48 | 33 | 1212 | 9 | 33 | 23 | 62 | 47 | 8 | 33 |
| 17 | 12 | 48 | 33 | 1213 | 11 | 44 | 29 | 6 | 10 | 9 | 9 |
| 17 | 12 | 48 | 33 | 1206 | 11 | 38 | 35 | 7 | 9.5 | 8.5 | 2 (o) |
| 4 | 19 | 15 | 081 | 1150 | 10 | 10 | 2 | 8 | 37 | 17 | 37 |
| 5 | 16 | 33 | 14 | 1169 | 2 | 2 | 74 | 4 | 97 | 37 | 37 |
| 5 | 16 | 33 | 14 | 1161 | 10 | 11 | 26 | 28 | 43 | 3 | 32 |
| 6 | 18 | 45 | 28 | 1162 | 10 | 82 | 36 | 48 | 43 | 7 | 29 |
| 6 | 18 | 45 | 28 | 1163 | 11 | 4 | 26 | 18 | 44 | 3 | 5 |
| 6 | 18 | 45 | 28 | 1164 | 14 | 38 | 20 | 28 | 9.5 | 9 | 8 (o) |
| 7 | 33 | 28 | 42 | 1055 | 12 | 2 | 25 | 51 | 19 | 56 | 19 |
| 8 | 31 | 49 | 33 | 1166 | 11 | 81 | 25 | 58 | 19 | 56 | 18.5 |
| 9 | 29 | 85 | 40 | 1167 | 13 | 50 | 32 | 7 | 16 | 9 | 16 |
| 9 | 29 | 85 | 40 | 1168 | 13 | 50 | 32 | 7 | 16 | 9 | 16 |
| 9 | 29 | 85 | 40 | 1169 | 15 | 87 | 40 | 4 | 4 | 4.5 | 5 |
| 9 | 29 | 85 | 40 | 1170 | 15 | 74 | 21 | 87 | 2.6 | 2.5 | 10 (o) |

The Iron Age

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The Outlook for an Increase in Copper Production.

One of the questions which is naturally considerably discussed as the result of the sudden speculative rise in the price of metals, and of copper in particular, is that bearing on an increase in the production. That increase may come from two sources, from the few mines which have been steady producers during the whole period of the depression, and, second, from the mines which were forced to close down because they could not make ends meet at prices current in 1886 and the first nine months of 1887. Whatever immediate increase is possible must almost exclusively come from the former. The best of them have been improving equipment, and have been enlarging capacity during the past two years. That holds good for all of the three great districts in this country—for the lake, Arizona, and for Montana. Many of them may have been keeping extraction close to costly development work, but at present prices may be depended upon to push the latter feverishly where needed and where it does not interfere with output of metal to the top notch of capacity of plant. The eagerness of managers to make the best possible record with the property under their charge may well be imagined when a number of them know that the profits on the metal they turn out range from 6 to 11 cents a pound. A few may have been caught with equipment crippled by long-neglected repairs, but even they will find liberal grants of funds for duplicate machinery, if necessary. A round bonus to the builders of the latter can easily be made to stimulate early delivery. Thus, the Tamarack Company, on Lake Superior, have only the other day contracted for the delivery of a new stamp to be put on the cars at Milwaukee on April 15, with a forfeit of \$25 per day for delay in delivery. But even with existing plant, and with crushing or smelting capacity which can be leased from idle companies in the leading districts, the concerns which have weathered the storms of the last few years can rapidly add to their output. It is from this source that the early increase in the output may be expected.

From the many mines which were active in earlier years and were forced to close down in 1884, 1885 and 1886 comparatively little need be expected. The very circumstances which made the depression so protracted operate against quick resumption. The report on copper in the volume on "The Mineral Resources of the United States," for the years 1883 and 1884, took up this point, as follows: "Before a mine is closed down, the force disorganized and the capital invested in it practically abandoned for at least an indefinite period, its reserves are exhausted, all dead work is suspended and repairs and renewals of plant are neglected. Work is continued, particularly in the case of joint stock enterprises, until all appeals to the stockholders fail to procure additional funds and credit is exhausted. The history of mining has taught this over and over again, and the course of affairs, for instance, in the Lake Superior district during 1883 and 1884 has abundantly confirmed it." Mines have been turned over to the tender mercies of the tributers, who proverbially "pick out its eyes." The result is that such idle mines are left with very little ore promptly available. It takes a considerable capital outlay and much time to pump out water, open new ground, retimber levels and shafts, repair machinery and equipment, and to gather a working force and supplies. In the case of a number of the older mines on Lake Superior, where supplies and fuel are put in before the close of navigation, very little can be done before spring. All these facts tell upon the impoverished and discouraged owners of such property, to which must be added the fact that the late speculative advance inspires little confidence in those who have suffered in copper mining in the past. They must look from three to six months ahead, and do not care to sink fresh funds in hitherto unproductive property on the strength of what may be a short-lived boom. To those who go into copper mining to stay all the dust raised by the speculative whirlwind of the past six weeks does not obscure the fact that with temporary causes obliterated we are steadily increasing in output; that in this country we can make more copper than we consume, and make it at a fair profit, too, for some years to come at somewhere below 11 and 12 cents a pound. The present time may offer a good opportunity to those who have idle copper property on hand to let others take the risks of future profits and gather experience in that business.

On the whole, therefore, production of copper is not so elastic as many might be inclined to believe. The product will certainly increase quite rapidly, but the amounts thrown upon the market by mines which have been idle for years will be small for six months to come. We look for the principal increase from those producers who have found 10 to 12 cents above the cost at which they could deliver the metal into consumers' hands.

All-Rail Rates on Lake Ores.

All-rail rates were recently agreed upon for the coming winter by the general freight agents of the different railroads running to the iron-ore mines of Michigan and Wisconsin. From the Gogebic range to Chicago the rate per ton was fixed at \$2.25; to Milwaukee, \$2; to Fond du Lac, \$1.40; to Depere, \$1.35; to Appleton, \$1.20. The Milwaukee and Northern Railroad will carry iron ore from Iron Mountain, in the Menominee range, to Chicago for \$2 per ton; to Milwaukee, \$1.25; to Depere, \$1.20. Rates from the Marquette range will be from 15 to 50 cents higher than from the Menominee range, according to the location of the mine. Great interest has been felt in the adoption of these rates for the winter, as it has been hoped by Western furnacemen that an effort would be made by some one of the railroad companies interested to build up a through traffic in ore which would continue the whole year round and not merely through the winter. The rates which have now been fixed have apparently been adjusted very carefully, so as to be high enough to protect the lake trade in the shipping season and not too high to prevent a little through traffic in ore when the lakes are frozen over. A difference of 25 cents a ton is all that is needed at present to invite heavy contracts with large consumers for all-rail transportation. A greater reduction may be necessary when vessel rates are reduced from the high figures prevailing during the past two seasons, but this is about the limit of the concession asked at present. It thus happens that, although some ore will be delivered by all-rail to Chicago consumers this winter, the quantity will not be so large as would otherwise have been the case.

The Milwaukee, Lake Shore and Western Railway is most prominent among the ore-carrying roads in its endeavors to build up through traffic, and, so far as supplying facilities are concerned, it is acting energetically. Air brakes will be used on its ore trains this winter, so that they can be run at a good rate of speed and make quick trips. The Milwaukee and Northern Railroad is also working actively in making connections with the Menominee and Marquette mines, and is getting into shape to command a large share of the traffic when all-rail shipments take the preference. The other railroads running into the ore regions will doubtless do what they can from time to time to divert through ore traffic over

their lines if they find that the conditions of the trade are being changed by their competitors.

This would seem to be an opportune time for some one of these railroad companies to take the lead in building up an all-rail trade. It will certainly be easier to do it while vessel rates are high and cargo room is scarce than after vessel rates have been reduced and owners are actively seeking charters. And if the traffic is once diverted from the lakes it will not return except in times of extraordinary prosperity. With arrangements for handling the business made by the railroad companies when rates are fairly remunerative, they can afford to take lower prices in years when all kinds of trade are dull and everybody is watching pennies. The advantages of receiving ore by rail as needed throughout the whole year, instead of having a seven months' supply stocked in their yards at the close of navigation, would by that time be so highly appreciated by consumers that it would require very strong inducements to tempt them to return to the old order of things. The change would also be the means of liberating furnacemen from their dependence upon the ore handlers employed in unloading vessels, who have shown themselves to be so difficult to manage, turbulent and unreliable that all sorts of expedients have been tried to supplant them, but without success, no machinery having yet been invented that will take their places. The nature of the work is such that only the lowest class of laborers will pursue it, and, as it does not properly belong to iron making, the managers of furnaces would be glad to get rid of it and those who are engaged in it. In this respect such a revolution would be accomplished by all-rail delivery that more would be required than a saving of a few cents per ton to induce a return to it when vessel rates fall.

Chili and the Rise in Copper.

Although the war cloud in Eastern Europe—which may at any moment degenerate into a war panic worse than the Afghan frontier scare—bodes no good to merchandise speculation, except, perhaps, in lead, grain and provisions, and possibly saltpeter, the metal boom, and especially that in copper, may last some time longer. About the latter Messrs. James Lewis & Son, Liverpool, wrote on December 1: "It is evident from the moderate charters received to day that it will be some time before Chili can increase its production, all the copper available for shipment for some time to come having been chartered for far ahead. So far, therefore, as we can judge, the supplies of copper cannot show much increase for the next four or five months, while the quantity of furnace material at present available unsold is confined to 380 tons of Mason's-Precipitate Smelters will, therefore, have to fall back on the stock of bars—now reduced to 33,524 tons in England and France—and pay the syndicate such prices as they choose to ask. Under these circumstances it is quite possible that we may ere long see a further important improvement in the value of this metal and that it may be maintained for some time." Chili may, therefore, have the benefit of a higher price for its chief product during a comparatively lengthened period, and this in its turn may exercise a favorable influence on the finances of the republic.

The changes in copper production during late years we dwell on at some length in an editorial dated April 21, from which we reproduce some figures:

World's Copper Production.

| | 1886. | 1885. | 1884. |
|---------------------------------|---------|---------|---------|
| Europe..... | 76,469 | 76,551 | 75,410 |
| North America..... | 78,780 | 77,705 | 66,750 |
| South America..... | 40,088 | 44,573 | 48,369 |
| Africa, Asia and Australia..... | 25,825 | 27,100 | 29,260 |
| Totals..... | 216,156 | 225,930 | 219,789 |

Chilian export during the first 11 months was only 29,275 tons, against 34,403 during the corresponding period of last year; at the above rate this year's shipments would not much exceed 31,500 tons, a decrease of 41 per cent, as compared with the 1879 export. Presuming that in all 1888 Chili will be able to ship 45,000 tons, instead of 31,500, and average for them £45, instead of £39 if the advance had not taken place, the increase would amount to £796,500, or, at 38d, \$5,030,526, Chilian silver.

Chilian finances are so favorably situated, and the credit of the Republic in Europe is so excellent, that nothing would have been easier than to raise a special sterling loan and use the proceeds for canceling the comparatively little paper money in circulation, thus returning to specie payments. Congress and the Government shrunk, however, from taking this measure, particularly in view of the suffering copper industry of the country, the low price obtained before the rise in the metal being attenuated by the paper dollar retaining its purchasing power at home, although depreciated when measured by the exchange in London.

The foreign debt of Chili on January 1, 1887, amounted to £7,208,900, to which has been added since the so-called 4½ per cent, £1,113,751 nitrate loan, with the proceeds of which the nitrate certificates were canceled

which Peru issued on the Tarapacá nitrate works. The home debt amounted to \$23,232,321 3 to 9 per cent. bonds, and \$26,687,916 paper money in circulation on January 1, 1886. The latter being canceled gradually at the rate of \$1,500,000 annually, till it is reduced to \$16,000,000, as much silver being kept in reserve in the treasury for the eventual resumption of specie payment in that metal. The paper money in circulation issued by banks is \$12,911,443.

The Government owns four railroad lines, of which 948 km. were in operation on January 1, 1885, and the cost of which was at the time \$42,107,934, and besides 6502 miles of telegraph. In order to reduce the annual interest disbursement on the foreign debt Chili, through Messrs. N. M. Rothschild & Son, London, recently converted the balances of five old loans of 1858 to 1875, aggregating £5,583,900, into a £6,200,000 4½ per cent. loan, out of which Peruvian bondholders received £315,000. The annual saving of interest through this transaction is \$1,253,737. On April 30 the home debt was \$48,898,066, but there was a surplus in the treasury on that date of \$8,000,000. If we deduct the value of the Government railroads and telegraphs from the entire national indebtedness, the latter will be found to be very moderate, considering the resources of the country and annual surplus of revenue. Thus the budget for 1888 estimates the income at \$36,000,000 and the outlay at \$32,440,000, the latter comprising considerable expenditure for public works formerly covered by loans.

Under the circumstances nothing would be easier than to float a loan through the Rothschilds and apply the proceeds toward ridding the country of the Government note circulation of about \$25,000,000. Thus the continual wide fluctuations in the exchange on London would be done away with. The silver dollar will then take the place of the paper dollar, and there will, of course, still be some exchange fluctuation in accordance with the price of silver; but this cannot be helped unless, while returning to specie payment, Chili should adopt the single gold standard. This would, however, present the inconvenience of an impediment in dealing with other South American, &c., countries on the silver basis; hence it is not likely that Chili will go a step further and adopt gold instead of silver. Still it may be worth while considering—in view of the large European trade Chili carries on—whether, if a change is to be made, it may not be more advisable to choose the gold standard outright.

With the disappearance of the main cause which made Chili hesitate about returning to specie payment—we mean the extreme depreciation of copper—there seems to be a strong inducement to place the finances of a prosperous country on a more manageable, solid footing. In Italy financial men also hesitated a long time about the resumption of specie payments, apprehending a crisis; yet everything went smoothly, although Italy has a monster debt and does not possess as manifold and vast resources as Chili, besides being politically more exposed than the latter.

Discriminations Against Localities.

When the Interstate act was under discussion in Congress and after its passage, when the Commissioners were appointed and its provision went into practical effect, it was the fourth or long and short haul section which received the attention of the railroad and business world. The prohibition of a greater charge for a shorter distance was emphatic, and naturally was first considered. Thanks to the wisdom of the commission, the feeling of alarm as to the possible injustice of the prohibition in certain cases was allayed, and yet, as it now turns out, if this celebrated section had been left out of the bill, entirely, the essence of it would still have been retained in the sections prohibiting undue preference to localities. So it comes about that the sections which say that all rates shall be reasonable, and that no undue preference shall be given to any individual, locality or trade, really embrace the pith of the whole law. In our public and newspaper discussions of unjust discriminations, it was usually the wrongs to individuals which were meant. These discriminations, by which a merchant in a town received a special cut rate which was denied to his neighbor, appeared flagrant on their mere statement. No special understanding or study of transportation intricacies were required to see their gross injustice, and being so clearly wrong, it was also clear that in some way they must be stopped.

On the other hand, discriminations against any particular town or city are far more subtle, and it is often with great difficulty that their right or wrong can be determined. From this circumstance it comes that of all the classes of cases likely to be brought before the Interstate Commission complaints involving the adjustment of rates between competing towns will most tax the intelligence and the wisdom of the commissioners. At the outset it may be observed that no trade center has any geographical right to the business it does, and by this we mean that such towns should depend upon their enterprise and not upon any system of rates for the continuance of their trade. The cases against the Chicago, Milwaukee and St. Paul Railway, just decided by the commission, involve this principle. This company owns two lines between Minneapolis and Chicago,

and by confining the traffic between these points to one of these lines at a low rate they thought they could charge double the rate upon the other without violating the long and short haul clause. Technically they could, but the higher principle prohibiting undue preference to any locality was ground enough for a decision against the railroad. The English commission has always laid stress upon competition of interest, and held that no technical defense should avail a carrier which gave favors to any place in its territory. A brewing town brought complaint against the Midland Railway because their rates on barley were higher by 1/11 per ton on the average than to their competitors. This was justified by the railway on the following grounds: a, the total traffic to this town was less than to others; b, the carloads were not as heavy; c, that more of the cars came away empty than from the other towns; d, that the cost of the staff of agent and men was 5/ more per ton than elsewhere. The court held that, a, the total traffic had nothing to do with the charges per car; nor, d, had the cost of employees unless the freight directly affected it; that, b and c, the weight of the loads and the number of empty cars were legitimate reasons for varying the rates, but that the then existing differences were too large. It will be seen that our commission are following in the footsteps of the English in applying the law to discriminations against localities—"rates must be not only reasonable in themselves, they must be relatively reasonable," they say, which is exactly the position long since taken abroad.

Differences in rates varying according to quantity are often favorable to particular places. In the case now before the commission the proper tariff relationship between oil in tank cars and oil in barrels, besides individual discrimination, involves also the matter of favorable rates to certain towns which may be able to buy a tank load. The general question of carload rates also covers the same thing. In arranging tariffs how shall we reconcile the rates from competing sections to the same markets? The simplest theory is that of mileage. Let every place be given tariffs in exact proportion to its distance. Practically this theory is not strictly carried out, and is not likely to be. In Europe and in America we find the principle evaded by group or section rates where all the places in a certain territory are given the same rates. All New England takes the same rates to and from Chicago. The ideal state of railroading would be where all places were put upon an equality in the selling market, and this may yet be the situation in the future, but at present distance is considered. For example, if such a thing would prove profitable to the railroads, there is no good reason why the New England and the Pittsburgh mills should not have the same rates on their products to the Western markets, and in turn why Pittsburgh should not have a favorable tariff to the far West as Chicago, and so with other places. But we must as yet consider distance, although enough has been said to show that the clause in the Interstate act forbidding undue preferences to localities has in its possibilities of discussion which go to the very foundation principles of transportation.

One of the points which is only too frequently forgotten in discussions bearing on the iron trade is the enormous fluctuations in the demand. This is strikingly shown in the case of rails. According to the figures compiled by Mr. James M. Swank, the apparent consumption—that is, the production plus the imports—doubled from 1868 to 1872, rising from 756,795 net tons to 1,530,850 net tons. Five years later it had again dropped back to about one half, falling off to 764,714 net tons in 1877. In four years it rushed up again to nearly treble the last figure, reaching 2,230,421 net tons in 1881. Again, it sank to less than one-half of the maxima attained in the short space of four years, falling to 1,096,667 net tons in 1885. A sudden recovery carried it back to the maximum of this year, which will show an apparent home consumption of at least 2,300,000 net tons. Whenever such maximum have been reached we have been forced to import, chiefly because for brief periods the rail mills were unable to meet the demand. In spite of the tremendous development of our steel industry there have been times when our equipment was inadequate. To be prepared to cover the requirements of extraordinary periods of consumption, averaging roughly one year in five, there must be enough capital invested in plant to take care of more than double the demand in at least one year of very slack trade. It is surprising that under such circumstances the fluctuations in prices are not far more violent than they have been of late years. It shows under what a tremendous strain of alternate feast and famine one of the greatest industries of the country must be. And yet the brief periods of prosperity are seized as a pretext for attacks which would force such an industry to stand the brunt of periods of depression, while it must share with foreign producers a short time of remunerative work. The fluctuations in the demand, with all its disadvantages over a steady, fairly uniform consumption, are the result of the spasmodic character of our progressive railroad construction and renewal. Alternately rushing in pell mell to invest in new mileage, and well nigh dropping entirely all work of development, our railroad companies and the investors and speculators in new enterprises

themselves are responsible for the evils which the jerky course of a great trade inflicts upon producers. As we grow richer and more conservative these evils may be lessened, but in the meanwhile the erratic course of production, and to a lesser degree of prices, should be attributed to causes which lie entirely beyond the influence of the producers.

It is stated on apparently good authority that there are now under contract at the shipyards of the lakes 60 vessels, against 39 at the corresponding time last year. The total valuation of the new tonnage under contract is \$3,325,000, against \$4,074,000 last year, and the total tonnage is 108,525 gross tons, against 65,750 tons last year. Of the new vessels all but five are to be propelled by steam. Seventeen of the new boats will be built entirely of steel, and their average cost will be \$250,000. At Cleveland alone 18 vessels are to be built, valued at \$3,392,000. These figures show the importance of the navigation interests of the lakes and of the trade which is dependent upon them. Changes may occur from season to season in the nature of the business seeking transportation over the lakes, but the population of the country bordering on them is growing so rapidly that what is lost in the diversion of some kinds of freights to the railroads will in all probability be made up in other ways. The boom in shipbuilding, however, must be only temporary, and it will not be long until the lake shipbuilders find a limited demand for new vessels, and a period of dullness will intervene until another wave of prosperity strikes them.

The Industrial and Financial Situation in the Argentine Republic.

To the Editor of *The Iron Age*.—DEAR SIR: My attention, as a close observer of the development of the Argentine Republic and the movements of her various forces, has been called to the editorial on "Argentine Progress," published in your paper of November 10th. It is principally based on a fanciful tale of economical misfortunes communicated from Buenos Ayres to the *Diario de Barcelona*, a Spanish paper remarkably reluctant to confess, and much given to impeaching the advancement of those countries now independent of Spain, which were so unfortunate and poor under the Spanish rule. I would have refrained from discussing such groundless opinion, built on misstatements and one-sided statistics, were it not that it has been to a certain extent indorsed, undoubtedly from momentary want of complete information, by your valuable paper, whose importance is appreciated in the Argentine Republic.

The substance of the criticism is that the Argentine Republic intends to build 6400 km. of railway at a cost of \$232,000,000, with a Government guarantee of 5 per cent. interest per annum on the capital invested. That a metropolitan railroad is to be built for the City of Buenos Ayres, and that a new steamship line, besides the many now plying between European and Argentine ports, has been subsidized with \$100,000 per annum; that the Provinces of Corrientes and Tucuman ask for a loan of \$8,000,000 and \$6,000,000 respectively; that the two leading banks, the "Provincial" and "Nacional," "larger in capital and volume of business than almost any others in the world," as one of the members of the South American Commission has said, lend unlimited help to real estate transactions and all new enterprises, causing by this conduct incipient uneasiness and an occasional fall of their mortgage "cedulas" in the London market; that a country guilty of this prosperity has a population of only 3,500,000, and has seen in the last years its imports exceed its exports by about \$27,000,000; that in all this is to be seen the demonstration of "the reckless manner in which things are proceeding at present in the Argentine Republic, by no means exempt from revolutions, like Chili, for example."

It can be emphatically said that the era of revolutions, although its last embers might yet sparkle here and there, is closed forever in the Argentine Republic. The reference to Chili, always ready to check the Argentine credit in the foreign markets, is certainly unwise. A glance at the true condition of both nations shows that the real difference between them lies in the fact that in the Argentine revolutions are a thing of the past, while in Chili they are coming. A country like the Argentine, where the native elements have with all their frankness and strength fought until the fittest have survived, cannot be properly compared with a country like Chili, where the masses of the people are reserving their strength to rebel in no distant day against their proud and ungracious lords. The republics that shrink from the healthful trials of liberty, apt to be fiercer when they have been delayed, are not as firmly established as those whose convulsions have been the heroic struggle to implant liberty and civilization in a country as amply favored by nature as it was ill prepared by its careless conquerors to enjoy in peace and utilize its natural resources. A nation is to be judged not by what time and history have not yet enabled it to mature, but by the importance and number of the obstacles it had to overcome to reach its position. A rudimentary knowledge of Spanish American history, unknown to most of its censurers, would suffice to change the sneer at its revolutions to cordial admiration.

I conceive that it may be difficult to understand even in the United States, where population has increased 79 per cent. in the last 25 years, how rapidly and yet naturally have national credit and wealth advanced in the Argentine Republic. Its population has increased 154 per cent. in the same 25 years. Its savings banks show a proportion of \$60 per capita, against \$49 per capita in this country. Its imports and exports, \$115,485,388 and \$79,943,442

to 4,500,000 inhabitants, leave far behind even those of the United States—\$75,000,000 and \$674,000,000 to 60,000,000. Its wealth per inhabitant in the province of Buenos Ayres is \$1245, against \$948 per inhabitant as it is here. Its purchases from a single country, England, reached last year \$49,706,418, while its purchases from the United States were only \$7,608,977.

When immigration to the Argentine increases at such a rate, that from 41,561 immigrants in 1880 it exceeded 100,000 in 1885; when by Argentine pluck a world has been recovered from the desert; when in a year the dreaded wastes of Patagonia have been converted into endless fields of pastures; when new agricultural colonies are raising cities in the wilderness; when 6512 km. of railway have been built, and are in operation under a customary guarantee of from 5 to 6 per cent. (although the Government has never been called upon to make good such guarantee); when these facts are considered, is it not an act of foresight to at least double the railroad system of such a country, which of late has more than doubled its available territory and its population, and do it under the same conditions that have proved so useful to the nation without embarrassing its Government? Why should it be deemed unsound when practiced by the Argentine to follow the railroad policy of the United States? Here the roads are built not in accordance with the actual population, but in anticipation of the increase in population sure to come, a policy which is all the more sound and commendable in a country which has nothing to fear, presently or in the perceptible future, from the labor problem. The United States with a population of about 60,000,000 has to-day nearly 150,000 miles of railroad in operation, while the Argentine Republic, with a population of 4,500,000 operates 6512 km. (3820 miles). That is to say, there are 2.5 miles for every 1000 inhabitants in the United States, to less than 1 mile for the same number of inhabitants in the Argentine Republic. At the ratio of mileage to population in the United States the Argentine should have not 4000 miles, as it now operates, but 10,500 miles as the example of the United States authorizes her to have. Even adding the 6400 km. (about 4000 miles) which, according to report, have been authorized by Congress, and the building of which will be the work of years, the total amount falls short by about one-third of the 10,500 miles the Argentine would be entitled to build by the experience of the United States. To provide for the inevitable consequences of a wonderful growth is but the simple duty of a country and a Government.

The loans to the provinces of Tucuman and Corrientes can only appear as extraordinary to a prejudiced correspondent who forgets that he is writing from a country where three provinces are now paying regularly a very handsome interest on similar loans, and where the provinces develop so fast, with railroads and banks of their own, that one of them, Santiago del Estero, has just declined to accept the subsidy voted by Congress in its favor, on the ground that its income is more than sufficient to cover its expenses, although it recently trebled the appropriation for public schools. The levity of the assertion that a recent revolution was hushed in Tucuman to allow the loan to be floated is apparent, as such a commotion as a revolutionary disturbance cannot well be hidden from the vigilant eye of an intelligent money-lender, who of his own free will has placed, not \$700,000,000, as the correspondent guesses, but \$15,000,000 in the Argentine Republic. From this investment he receives such a profitable interest that his uneasiness was recently noticeable when the most thrifty German, in the face of the catastrophe the *Diario* is willing to predict, hastened to offer to the Province of Buenos Ayres (the province of the bank whose management provokes the *Diario's* aspersions) a loan of 55,000,000 marks. The rates of interest for several Argentine loans are 6.6, 6.2 and 5.95. How can an Englishman fail to insist upon placing his money at the disposal of a province in a country where he securely gets 6.6 per cent. on the money he has already loaned to the province of Entre Rios?

The banks, it is alleged, are lending too much money; they foster real estate speculation; they actually advance on vacant lots; they even go so far, the *Diario* says, as to advance more than the value of the mortgaged land. It could be possible in the Argentine Republic that the prospect of an almost fabulous progress would create that over-confidence which, not many years ago, the prospect of wealth created, not only in individuals, but in the legislative bodies of the great Northwest. Extravagance, at all events, would teach its own lesson there, as it did here. But in a country where the science of banking has, of its own growth, and from the strength of native talent, reached a degree not to be excelled, the "Banco de la Provincia" (with a paid-up capital of \$37,000,000, a circulation of \$22,000,000 and deposits amounting to \$67,000,000) can well afford to foster the business of the leading province of a country. The possessions in live stock of the Republic alone are 18,635,400 head of cattle, 134,250,000 of sheep and 5,200,000 of horses. Its explorations to the north and south are opening fields of wealth. Its cities (in the words of W. Elcroy Curtis) "grow faster than Denver or Minneapolis," and its annual ratio of commerce is \$49 per inhabitant, against \$29 in the United States.

In wire fences only the Argentine Republic has spent more than \$30,000,000 "in less than 30 months." Says *La Revue des Deux Mondes*: "A city of 40,000 inhabitants has sprung to life, with its marble palaces, its granite theaters and its elegant faubourgs." Ports are being opened; immigrants are incessantly arriving; new communications are populating the immense gardens of the interior. In 1886 nearly 900,000 acres of virgin land were ploughed and planted; Patagonia, with its mines and its pampas, has been revealed to civilization—all this wealth, like most of that of the United States to New York, comes on its way to the world through the Province of Buenos Ayres. Why, in the full development of the situation it has contributed to create, ought the bank of the province to depart from the liberal policy under suffi-

cient guarantee that has produced such splendid results at home and such a credit abroad?

But with all that, it might be said that the imports have exceeded the exports by about \$27,000,000. In extraordinary years of building new cities, opening of ports, increasing of railroad facilities, and ploughing of wild lands, such an excess is naturally explained by the unusual and temporary demand for foreign articles, indispensable to a country of new born industries. Immigration, the new agricultural colonies, the vast plains of Patagonia capable of feeding unlimited herds the increase in the production of provisions and breadstuffs, overshadow by far this fictitious debit balance in the foreign trade upon which the ominous prediction of the *Diario* is exclusively based.

In Buenos Ayres, as elsewhere, there is some danger of the intoxication by prosperity which no powerful republic or ancient monarchy has known how to prevent. But that probable evil must not be unjustly anticipated by the busy mind of the mortified rivals of the young republic, nor laid by prejudiced correspondents at the door of a Government whose actions are thoroughly commented on by a press as free as any in the world, and by a parliament where eloquence has already lost, in the practical trials of the new nation, the pompousness that in the years of national infancy could have been a subject of deserved censure.

Your article ends thus: "Fortunately the investment of American capital is, so far as known to ourselves, limited to one railroad, and the trade we are doing is strictly for cash, in gold, so far as we are aware." William Wheelwright, the Yankee who, rising with the Argentine, built there a fortune for himself, and whose memory has been honored with a monument, would certainly not have indorsed such an opinion. He would have said, with Mr. W. Elcroy Curtis, in the words with which he begins a recent article in *Harper's Magazine*: "For a people so boastful of their enterprise and intelligence, we are shamefully ignorant of what is going on at the other end of the hemisphere, although transactions there are of much greater concern to us than the struggle for home rule in Ireland, or the invasion of Afghanistan."

Thanking you for the space allowed to this rectification, I remain, dear sir, yours very sincerely

J. M.

The Output of the Pratt Mines.

To the Editor of *The Iron Age*.—DEAR SIR: Referring to your editorial on "Iron Making in the Birmingham District," page 22 of last Thursday's issue, you say that the best record of our Pratt Mines is 2400 tons per day for part of a month, and this after long preparation. We have so many Northern stockholders who watch the technical journals for information as to our work that I am sure you will grant us the favor of making a correction. Our output at the Pratt Mines for the 26 working days of last month was an average of 2806 per day; this month it has been to date 2907 per day. The largest day's output was 3167, and only shortage of railroad cars keeps us below that. As our new furnaces at Easley will receive their supply direct switched from one track to another, the cars now in use will admit of a large increase when next month we commence deliveries for the new plant. It is also right to say that out of the five new and independent collieries which we have now been developing for a year only one has commenced to ship coal, and that on a small scale. But all the other four will be ready to ship coal within from 60 to 90 days. The "long preparation" quoted has not yet been felt on the shipments, and is not represented by the quoted figures. It may be of interest to you to state generally that from all our collieries we last month raised not less than 115,000 tons of coal.

Yours very truly,
Fennessee Coal, Iron and Railroad Company,
J. BOWEN,
Secretary and Treasurer.
NASHVILLE, TENN., Dec. 12, 1887.

Good Furnace Work at Troy.

To the Editor of *The Iron Age*.—DEAR SIR: Knowing that you have been watching our blast furnace experience with some interest, I send you below the result of the first 18 days in this month. As you know, we have never blown in No. 1 furnace. It is ready for the match when trade will justify its being applied. During the time stated, No. 2 has made a daily average of 179,111 tons; and No. 3 made an average of 165,111 tons. No. 2's largest day's work was 207,111 tons on December 8; while on December 5 it made 205,889 tons. On December 3 No. 3 made 233,889 tons. As our ore mixture is but about 54 per cent, we do not think we need offer any excuses, even while remembering the big figures of our Western friends, made with their rich ores and Connellsville coke. At the same time, we are not satisfied and hope to do better. At present we are making iron with 2165 pounds Rochester and Pittsburgh coke to the ton of pig. It should be remembered that our furnaces are 18 x 80 feet. I remain, yours truly,

ROBERT W. HUNT,
Gen'l Supt. Troy Steel and Iron Co.,
Troy, N. Y., December 19.

Obituary.

WILLIAM MULLIGAN.

William Mulligan, who died in this city on the 11th inst., was widely known throughout the country as an iron manufacturer. He was born in New Brunswick, N. J., on the 19th of November, 1826, and commenced his career in the iron business in 1846, with the New Jersey Iron Company, at Bonton, N. J., remaining there until the autumn of 1855, having during this period visited the leading iron manufacturing centers in England and Wales, and made himself thoroughly familiar with their methods. In 1855 he formed a connection with Messrs. Chouteau, Harrison & Vale, of St. Louis, and while there built the rolling mills known

as the Laclede Iron Works, where shortly after the breaking out of the war he made large quantities of armor plates for the Government gunboats. He severed his connection with this firm in the latter part of 1861. In July, 1863, he took charge of the Ulster Iron Works, having formed an alliance with Messrs. J. & L. Tuckerman. One year later the firm of Tuckerman, Mulligan & Co., was formed, and under the immediate supervision and direction of Mr. Mulligan the manufacture of Ulster iron, so well known throughout the country, was continued and extended and its reputation increased. It was during the period of his management of the Ulster Iron Works that the iron was made for the tubes for the large smooth-bore guns which were converted into breech loading rifles by the West Point Foundry. The stipulations for the quality of this iron were so stringent that, previous to his undertaking it, it was not thought possible to get it made in this country. His business career was a successful one, and his uprightness of character and his genial and cheerful disposition endeared him to all who knew him. A staunch and loyal friend, he was ever ready to extend aid and counsel, and his loss will be keenly felt.

J. F. STUDEBAKER.

J. F. Studenacker, secretary of Studenacker Brothers Manufacturing Company, of Chicago and South Bend (Ind.), died at Chicago on the 17th inst., of peritonitis. The deceased was 42 years of age, and the youngest of five brothers—the youngest of thirteen children. He was born in Ohio. He was associated with his brothers in conducting the manufacture of wagons and carriages, in which they have built up a name well known throughout the entire country and in many foreign lands. To his watchful care was intrusted the mechanical department of the Chicago carriage factory, and by his energy and close attention helped to build up the institution to its present eminence. He was also known to the public as the promoter and largest stockholder of the Percheron Horse Company, in Colorado.

WASHINGTON NEWS.

(From Our Regular Correspondent.)

WASHINGTON, D. C., December 20, 1887.

Mr. Randall and those who agree with him upon the methods of surplus revenue reduction have not yet abandoned all hope of reaching a point of compromise upon which they can agree. They have notified the Speaker, however, in a general way, that they will not accept any measure which does not embrace internal revenue repeal. The conservative wing of the majority have been looking over the ground, and have several propositions before them. They are opposed, however, to free wool, and are not inclined to accept free ore. They admit that some reduction must come out of the customs, but they are determined that it shall not be in a manner to disastrously affect the interests of home industries. They have some suggestions in the nature of a revision of the metal schedule of the tariff of 1883, which may be considered at the proper time, the chief purpose of which is to break up undervaluations, to change ad valorem to specific rates where practicable, and to protect certain industries not now adequately guarded against the ruinous competition of the cheap labor of the Old World. Among some of the proposed changes may be mentioned the following, the amendments being in italics:

Amend paragraph 141 to read as follows: 144. Iron ore, including magniferous iron ore, also the dross or residuum from burn and pyrites, 75 cents per ton. Sulphur ore as pyrites, or sulphuret of iron in its natural state, containing not more than 3 1/2 per cent. of copper, 75 cents per ton. Provided: That ore containing more than 2 per cent. of copper shall pay, in addition thereto, 2 1/2 cents per pound for the copper contained therein.

And provided further, that in levying and collecting the duty on iron ore, the weight of the ore in its natural state as it comes from the mine shall not be reduced on account of any claim for allowance of moisture which may be chemically or physically combined with the ore.

The rate is the same as existing; the amendment is in conformity with a decision of the Secretary of the Treasury.

Amend paragraph 151 to read as follows: 151. Boiler or other plate iron and steel, sheared or rolled in grooves, 1 1/2 cents per pound; sheet iron and steel, common or black, valued at four cents per pound or less, thinner than one-eighth of one inch and not thinner than number twenty wire gauge, 1 1/2 cents per pound; thinner than number twenty wire gauge and not thinner than number twenty five wire gauge, 1 1/2 cents per pound.

Thinner than No. 25 wire gauge and not thinner than No. 29 wire gauge, 1 1/2 cents per pound. Thinner than No. 29 wire gauge, and all iron and steel commercially known as common or black taggers iron or steel, whether put up in boxes or bundles or not, one and nine tenths cents per pound. [Iron is 30 per cent. ad valorem.]

Steel sheets and plates of all gauges and thicknesses, valued above 4 cents a pound and not above 7 cents per pound, 2 cents per pound; valued above 7 cents and not above 10 cents per pound, 2 1/2 cents per pound; valued above 10 cents per pound, 3 1/2 cents per pound.

Corrugated or crimped sheet iron or steel, 1 1/2 cents per pound. And provided, that on all such iron and steel sheets or plates aforesaid, excepting on what are known commercially as tin plates,terne plates and taggers' tin, and hereafter provided for, when galvanized or coated with zinc or spelter, or other metals, or any alloy of those metals, 3/4 of 1 cent per pound additional duty shall be paid.

Amend paragraph 153 to read as follows: 153. Iron or steel sheets or plates, or taggers iron or steel, coated with tin or lead, or with a mixture of which either of these metals is a component part, by the dipping or any other process, and commercially known as tin plates,terne plates and taggers' tin, two and two-tenths cents per pound.

The present rate is 1 cent per pound. The new rate was recommended by the Tariff Commission.

Amend paragraph 155 to read as follows:

155. Iron or steel cotton ties or hoops for baling purposes, not thinner than number twenty wire gauge, one and four-tenths cents per pound.

Now 35 per cent. ad valorem.

Amend paragraph 177 to read as follows: 177. Steel ingots, cogged ingots, blooms and slabs, weighing not less than five hundred pounds each, and measuring not less than five inches square nor less than five inches in least diameter of cross sections of ingots, cogged ingots, or blooms, not less than five inches in thickness nor less than ten inches in width of the slabs, six tenths of one cent per pound.

Steel ingots, cogged ingots, blooms and slabs weighing less than five hundred pounds each, and measuring less than five inches square, or less than five inches in greatest diameter of cross section of the ingots, cogged ingots or blooms, and less than five inches in thickness, or less than ten inches in width of the slabs, one cent per pound.

Steel die blocks or blanks; all billets and bars, and tapered or beveled bars; bands, hoops and strips; stainer cranks and other shafts; wrist or crank pins, connecting rods and piston rods; pressed, sheared or stamped shapes or blanks of sheet or plate steel or combination of steel and iron, punched or not punched; saw plates, wholly or partly manufactured; hammer molds or swage steel; gun barrel molds not in bars; alloys used as substitute for steel tools; all descriptions and shapes of dry sand, loam or iron molded steel castings. All of the above valued at two cents per pound or less, one cent per pound; valued above two cents, and not above seven cents per pound, two cents per pound.

Valued above seven cents and not above ten cents per pound.

Valued at above ten cents per pound three and one-half cents per pound.

Provided that on all iron or steel bars, rods, strips or sheets of whatever shape, other than the polished, planished or glazed sheet iron or sheet steel heretofore provided for, and in all iron or steel bars of irregular shape or section which are cold rolled, cold hammered or polished in any way, in addition to the ordinary process of hot rolling or hammering, there shall be paid 1/4 cent per pound in addition to the rates provided in this act, and on steel circular saw plates there shall be paid 1 cent per pound in addition to the rates provided in the act for saw plates.

The classification is about the same as that recommended by the Tariff Commission.

Amend paragraph 180 to read as follows: 180. Iron or steel rivet, screw, nail, fence and wire rods, rounds, in coils and loops, valued at 3 1/2 cents or less per pound, one cent per pound.

Iron or steel, flat, with longitudinal ribs for the manufacture of fencing, one cent per pound.

Now 1/2 of a cent per pound on sizes not smaller than No. 5 wire gauge and 45 per cent ad valorem on smaller. The limitation is designed to remove the smaller sizes from ad valorem classification.

Amend paragraph 182 to read as follows: 182. Iron or steel wire, not smaller than No. 10 wire gauge, 1 1/2 cents per pound. Smaller than No. 10 and not smaller than No. 16 wire gauge, 2 cents per pound.

Smaller than No. 16 and not smaller than 26 wire gauge, 45 per cent. ad valorem.

Provided that iron or steel wire covered with cotton, silk, or other material, and wire commonly known as eroline, corset and hat wire, shall pay 4 cents per pound in addition to the foregoing rates.

And provided further, That no article made from iron or steel wire or wire rods, or of which iron or steel wire or wire rods is a component part of chief value, shall pay a less rate of duty than the iron or steel wire or wire rods from which it is made, either wholly or in part.

And provided further, That iron or steel wire cloths, and iron or steel wire nettings, made in meshes of any form, shall pay a duty equal in amount to that imposed on iron or steel wire, or wire rods of the same gauge, and 2 cents per pound in addition thereto.

There shall be paid on galvanized iron or steel wire (except fence wire) or wire rods one-half of one cent per pound in addition to the rate imposed on the wire or wire rods of which it is made.

On iron wire rope and wire strand, 1 cent per pound in addition to the rates imposed on the wire or wire rods of which it is made.

On steel wire rope and wire strand, 2 cents per pound in addition to the rates imposed on the wire or wire rods of which it is made.

The sizes smaller than No. 26 wire gauge is changed from 3 cents per pound to 45 per cent. ad valorem. Wire rods are inserted with wire to stop technical evasion of duty.

The objection to these recommendations is, that they do not cover the ground comprehensively, but simply take up certain industries, leaving others to shift for themselves. This point will be pressed at the proper time.

Representative Mills, of Texas, who is now conceded to be the coming chairman of the Committee on Ways and Means, has had a long talk with the President, and has plainly informed him that it would be absolutely impossible to pass any measure based upon the recommendation of his message. That the only hope of bringing in the Randall support would be a recognition of internal revenue repeal. The President expressed some surprise about this. Mr. Mills informed him that at least 50 Democrats stood with Mr. Randall on that point.

The great timber raft which started from Nova Scotia 5th inst. for New York was lost in a heavy gale when southwest of Nantucket, and being near to the steamship route is a serious menace to navigation. The owner of the raft, a shipbuilder in this city, holds that the company towing the raft are responsible for her loss in not going to sea at an earlier date, as per contract.

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Pardee A. & Co., 111 Broadway, N. Y. 36

Coal and Hat Hooks
Jayne & Crosby 110 Liberty, N. Y. 6
Van Wagener & Williams Co., 82 Beck-
man, N. Y. 36

Coffee and Spice Mills
Lane Bros., Poughkeepsie, N. Y. 34

Coke
Schoonmaker J. M., Pittsburgh, Pa. 4
Commission Merchants, Iron, Steel,
&c.
Howard Childs & Co., Pittsburgh, Pa. 4

Cotton and Wool Waste
Childs, H. L. & Co., Pittsburgh, Pa. 6

Copper
New Haven Copper Co., 294 Pearl, N. Y. 2

Cordage
Elizabethport Steam Cordage Co., 48
South, N. Y. 31

Corn Shellers
Garry Iron Roofing Co., Cleveland, O. 9

Corrugated Iron
Cincinnati Corrugating Co., Cincinnati, 37
Mason Iron Bridge & Roof Co., 6 Day,
N. Y. 37
Sagendorf Iron Roofing and Corrugat-
ing Co., Cincinnati, Ohio 37

Coverings, Boiler and Pipe
Chalmers-Spence Co., 419 Eighth, N. Y. 9
Shields & Brown, Chicago, Ill. 42

Cranes
Sellers Wm. & Co., Philadelphia, Pa. 43

Curry Combs
Southampton Cutlery Co., Southampton,
Conn. 10

Cutlery, Importers of
Clatworthy F. & W., 82 Chambers, N. Y. 10

Cutlery, Manufacturers of
Goodell Co., Antrim, N. H. 9
K. Wallace & Sons Mfg. Co., 21 Park
Place, N. Y. 32

Dampers
Shepard Hardware Co., Buffalo, N. Y. 44

Discount Book
Williams David, 66 and 68 Duane, N. Y. 34

Door Checks
Graves E. E., Bridgeport, Conn. 12

Door Hangers, House and Barn
Lane Bros., Poughkeepsie, N. Y. 34
Stearns E. C. & Co., Syracuse, N. Y. 34

Door Knobs
Boston Knob Co., Boston, Mass. 31

Drilling Machines
Dallett Thos. H. & Co., Philadelphia, Pa. 43
Wiley & Russell Mfg. Co., Worcester, 12
Mass. 41

Drop Forgings
Beecher & Peck, New Haven, Conn. 43
Merrill Bros., 20 First, Brooklyn, N. Y. 42
Philadelphia Drop Forge Co., Phila., Pa. 40
Scranton Forging Co., Scranton, Pa. 40
Wyman & Gordon, Worcester, Mass. 40

Drop Presses
Beecher & Peck, New Haven, Conn. 43

Drummers, Makers of
White L. & J., Buffalo, N. Y. 12

Egg Beaters
Hamblin & Russell Mfg. Co., Worcester, 12
Mass. 41

Electric Lightings
The Brush Electric Co., Cleveland, O. 37

Electric Dynamo Machines
Zucker & Levett Chemical Co., 538 to
540 West 16th, N. Y. 25

Electrical Supplies
Wollensak J. T., Chicago, Ill. 9

Electro-Platers
Boardman L. & Son, East Haddam, Ct. 10

Elevators, Makers of
Morse, Williams & Co., Philadelphia, Pa. 43
Stokes & Parrish Machine Co., Phila. 42

Emery Paper, Cloth, &c.
Lapole Emery Mills, South Walpole, N. H. 28

Emery Wheels
New York Wheeling and Packing Co., 15
Park Row, N. Y. 9
Northampton Emery Wheel Co., Phila., Pa. 9
Springfield Glue and Emery Wheel Co.,
Springfield, Mass. 30

Enameling
The Enameling Co., Stroudsburg, Pa. 32

Engineering Implements & Supplies
Queen & Co., Philadelphia, Pa. 4

Engines
Johnson & Wilson, 91 Liberty, N. Y. 44
Engines
Bradley & Co., 214 Richmond St., Phila. 5
Wm. H. Haskell Co., Pawtucket, R. I. 40

Engines
Elmer & Amend, 205 Third av., N. Y. 9

Engines, Manufacturers of
Buck Bros., Millbury, Mass. 13
Jennings C. E., 79 Reade, N. Y. 31

Engines
Smith & Egge Mfg. Co., Bridgeport, Conn. 39
Union Mfg. Co., 103 Chambers, N. Y. 7
D. E. Whiton Mach. Co., New London,
Conn. 43

Engines Dryers
Chicago Laundry Dryer Co., Chicago, Ill. 38

Engines
Borden & Lovell, 70 West, N. Y. 36
Pardee A. & Co., 111 Broadway, N. Y. 36

Engines and Hat Hooks
Jayne & Crosby 110 Liberty, N. Y. 6
Van Wagener & Williams Co., 82 Beck-
man, N. Y. 36

Engines and Spice Mills
Lane Bros., Poughkeepsie, N. Y. 34

Engines
Schoonmaker J. M., Pittsburgh, Pa. 4
Commission Merchants, Iron, Steel,
&c.
Howard Childs & Co., Pittsburgh, Pa. 4

Engines and Wool Waste
Childs, H. L. & Co., Pittsburgh, Pa. 6

Engines
New Haven Copper Co., 294 Pearl, N. Y. 2

Engines
Elizabethport Steam Cordage Co., 48
South, N. Y. 31

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Mason Iron Bridge & Roof Co., 6 Day,
N. Y. 37
Sagendorf Iron Roofing and Corrugat-
ing Co., Cincinnati, Ohio 37

Engines, Boiler and Pipe
Chalmers-Spence Co., 419 Eighth, N. Y. 9
Shields & Brown, Chicago, Ill. 42

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Goodell Co., Antrim, N. H. 9
K. Wallace & Sons Mfg. Co., 21 Park
Place, N. Y. 32

Engines
Shepard Hardware Co., Buffalo, N. Y. 44

Engines
Williams David, 66 and 68 Duane, N. Y. 34

Engines
Graves E. E., Bridgeport, Conn. 12

Engines, House and Barn
Lane Bros., Poughkeepsie, N. Y. 34
Stearns E. C. & Co., Syracuse, N. Y. 34

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Boston Knob Co., Boston, Mass. 31

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Mass. 41

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Wyman & Gordon, Worcester, Mass. 40

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Beecher & Peck, New Haven, Conn. 43

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White L. & J., Buffalo, N. Y. 12

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New York Wheeling and Packing Co., 15
Park Row, N. Y. 9
Northampton Emery Wheel Co., Phila., Pa. 9
Springfield Glue and Emery Wheel Co.,
Springfield, Mass. 30

Engines
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man, N. Y. 36

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Engines

Hood for Fireplace.

H. Clayton & Co., 123 West Fifth street, Cincinnati, Ohio, are introducing a supplemental hood for fireplaces, some applications of which are illustrated in the accompanying engravings. The hood is adjustable and is intended to act as a cure for smoky fireplaces. It is adapted for being placed over a grate with a semi-circular top; also with a square top. By referring to the engravings submitted herewith, it will be noticed that in the square-



Fig. 1.—The Hood Laid Flat, Showing the Provision for Extension and Contraction.

justable and is intended to act as a cure for smoky fireplaces. It is adapted for being placed over a grate with a semi-circular top; also with a square top. By referring to the engravings submitted herewith, it will be noticed that in the square-



Fig. 2.—The Hood Applied to a Round-Top Grate.

top grates it admits of being placed in either of two ways. Fig. 1 of the engravings shows the hood and its features of construction; Fig. 2 shows its application to a round-top opening, while Fig. 3 shows the hood placed horizontally against a square-top

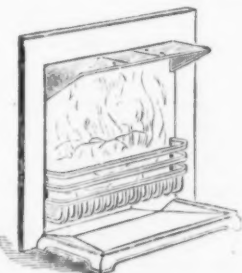


Fig. 3.—The Hood Applied to a Square-Top Grate.

opening. Fig. 4 shows the hood reversed, bringing it down nearer the fire and facilitating the draft. The hood is extensible, so as to be adapted to use in fireplaces of different widths. This article, we are informed, is made in two styles—tin, finished

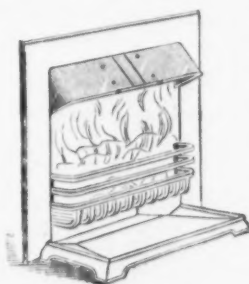


Fig. 4.—The Hood Reversed, Changing the Angle.

in Japan, and brass highly polished. The circular which the manufacturers have published contains a very flattering indorsement of the apparatus.

New Form of Weather Strip.

The cut below shows a form of rubber strip which D. W. Bosley & Co., 273 East Madison street, Chicago, Ill., are putting upon the market. The special features to which attention is directed in the circular before us is the shape in which it is manufactured, an idea of which is afforded by the engraving. It will be noticed that the upper portion is thicker than the lower portion, thus affording a good and sufficient means for attaching to the door or window against which it may be applied. The lower portion, being flexible, serves as an apron to exclude the cold. Among the advantages to which the manufacturers direct attention may be mentioned that there is no sawing necessary in putting this weather strip in place. It comes in rolls, and is cut to length very readily with a pair of shears or knife, whichever may be most convenient. It is put up by nailing through the upper portion.



Weather Strip, Manufactured by D. W. Bosley & Co., Chicago, Ill.

An interesting trial of electrical hauling plant has just taken place at the Newcastle (England) Exhibition with a view to demonstrate the applicability of this method of traction to underground workings. The motor was geared by worm and worm-wheel to a sheave 5 feet in diameter. It drew

seven loaded tubs weighing 5 tons 6 cwt. 1 qr. up a road having a variable gradient averaging 1 in 75. The tractive force varied between 312 pounds and 704 pounds. The power exerted by the rope varied from 4.85 horse-power to 7.7 horse-power on the up-grade, while the power absorbed by the

motor was about 11 horse-power, the unsatisfactory arrangement of the gearing accounting for a great part of the loss, its efficiency being only about 40 per cent.

Self-Pouring Teapot.

Paine, Diehl & Co., Philadelphia, Pa., are putting on the market Royle's Patent Self-Pouring Teapot, which is illustrated in the accompanying cut, which indicates its characteristic feature. It will be observed that the tea is poured without lifting the teapot, an operation which is accomplished by pressure upon the lid, which has a cylindrical attachment, the opening in the teapot being so formed as to serve as a cylinder, so that the lid operates as a plunger, giving a regular pump action. This cylindrical lid has a hole in the top or knob which permits the air to enter while the lid is being raised, but in pressing down the lid this hole is closed by the finger, as shown in the cut, when by pneumatic pressure the tea is forced through the spout. This knob is made of



Self-Pouring Tea Pot.

non-conducting material so as to avoid any difficulty from its becoming heated. Another feature which is not illustrated in the cut is the fact that the entrance to the spout is from the bottom of the pot, in which there are a sufficient number of minute apertures to permit the flow of the tea and yet preventing the escape of the leaves. In connection with the advantage possessed by this simple and unique contrivance in obviating the necessity for lifting the teapot, it is explained that there is a considerable saving in the tea required from the fact that the tea is forced through the leaves, and not poured off the top as in the usual style, the strongest tea being among the leaves. Eight patterns of these teapots are made in Britannia metal with a capacity of 4, 6 and 8 half-pints, and three patterns are made in silver plate in 5, 6 and 7 half-pints.

The Reddy Economizer.

We present to our readers this week, by means of the accompanying illustration, what is known as the Reddy Economizer, a device which is being manufactured and put upon the market by Mr. James M. Reddy, of No. 314 State street, Chicago. This is a device intended to increase the heating power of a stove, or to heat an upper room without requiring the purchase of another stove and the maintenance of an additional fire. The cut herewith shows the economizer fitted for use in an upper room, having feet with which it can stand on the floor. The smoke-pipe from the stove in the room below connects with the base of the economizer. Enough of the interior construction is shown to illustrate the method in which the products of combustion are deflected in their upward passage so as to strike the



The Reddy Economizer.

sides of the interior flue and thus heat it thoroughly, so as to warm the air passing from the room into the vertical passages between the outside jacket and the smoke flue. In this way the air of the room is kept in circulation, cold air constantly coming to the economizer to take the place of the heated air passing upward. This device can also be used in place of a joint of stove pipe, so as to increase the heating power of a stove. In that case it is without feet. The top and bottom are cast iron, and the remainder is made of sheet iron.

MANUFACTURING.

Iron and Steel.

A recent issue of the Cincinnati (Ohio) Telegram says: "A decree of confirmation of the sale of the Riverside Rolling Mill property to R. W. Wilson has been given by Judge Buchwalter and a partial distribution of the proceeds ordered. The Master Commissioners have \$13,333.34 in their hands, the amount of the first payment. Of this amount \$523.50 is decreed to the Master Commissioners for fees and expenses; \$808.60 to Harlan P. Lloyd, the trustee of E. L. Harper & Co., and \$695.28 to the Treasurer of Hamilton County for taxes and penalty for the last half of 1886. The balance, together with the notes and mortgages securing the deferred payments, is to remain in the hands of the Master Commissioners until further order of the court. The question of the right of dower of Mrs. Emma B. Harper is reserved for further consideration."

It is stated that a company will shortly be organized to operate the Laclede Rolling Mills, at St. Louis, which have been idle for some time.

Under date of the 16th inst. the Bethlehem Iron Company, of Bethlehem, Pa., gave notice of a general reduction of 10 per cent in wages, to take effect January 1. The reason assigned is that "the condition of trade and the reduced price of rails in the market make it necessary for this company to reduce the expense of manufacture." This reduction still leaves wages several per cent. higher than before the advance of last winter.

The strike of the employees of the Kitting Iron Company, Limited, at Kittanning, Pa., which has been in progress for some weeks, has been satisfactorily settled, and the works resumed operations in all departments on the 16th inst. The men went on a strike on account of alleged hard iron given them to work.

Belmont Furnace, of the Belmont Nail Company, at Wheeling, W. Va., resumed operations last week.

Lucy Furnace, of the Thomas Iron Company, at Hokendauqua, Pa., has been blown out for repairs.

The following is the remarkably good record of the blast furnace of the Bellaire Nail Works, at Bellaire, Ohio, for 18 days, ending on the 11th inst.:

| | Tons. | | Tons. |
|-------------|-------|-------------|-------|
| November 24 | 139 | December 3 | 146 |
| November 25 | 131 | December 4 | 133 |
| November 26 | 140 | December 5 | 146 |
| November 27 | 131 | December 6 | 154 |
| November 28 | 154 | December 7 | 154 |
| November 29 | 136 | December 8 | 132 |
| November 30 | 138 | December 9 | 130 |
| December 1 | 126 | December 10 | 159 |
| December 2 | 126 | December 11 | 152 |

Total product, 2686 tons, or an average of 149 tons of 2268 pounds per day. Coke used was 2100 pounds to a ton of metal of 2268 pounds. The average silicon was 2.30 per cent.; average sulphur, 0.036 per cent.; phosphorus, 0.084 per cent.

The plate department at the National Rolling Mill, at McKeesport, Pa., suspended last week for several weeks, during which time an entire new foundation will be put under the mill, and it will be prepared to work the great plates from which the 24-inch pipe will be welded. The department will hardly resume within the next month, and 200 men will be idle in the meantime.

A rumor has been recently published in Pittsburgh to the effect that Joseph G. Beale, formerly a member of the firm of Jennings, Beale & Co., proprietors of the West Penn Steel Works, had purchased a large tract of land at Freeport, Pa., and would at once commence the erection of a large steel works. We are in receipt of a communication from Mr. Beale on this subject, in which he states that there is no truth in the rumor whatever.

The Tallapoosa Malleable Iron Works have been organized at Tallapoosa, Ga., with N. N. Lind as president, John F. Lang, secretary, superintendent and general manager, and Joseph Landgren, treasurer.

The St. Louis Bridge and Iron Company, of St. Louis, have been incorporated under the laws of Missouri, with a capital of \$10,000, by H. W. Sebastian, F. W. Schulte and R. H. Phillips. The company does not represent a new enterprise. An election for officers will be held after the charter is granted.

The Edgar Thomson Steel Works, of Carnegie Bros. & Co., Limited, at Braddock, Pa., closed down on Saturday, the 17 inst., for the purpose of making repairs.

The Lorain Mfg. Company, of Lorain, Ohio, are receiving bids for an iron foundry building to be T-shaped, each arm 170 x 100 feet, to be completed May 1, 1888.

The Youngtown Rolling Mill Company have elected Mr. John H. Wells treasurer and Mr. John M. Evans secretary. These gentlemen will together manage the business. This action was taken in view of the resignation of Mr. Henry Wick, who was secretary, treasurer and general manager. Mr. Wick will take charge of the Alderice, Bishop & Co. mill, at Warren, under an arrangement with the creditors. Mr. Wick states that the published report that he had also accepted the management of the Warren Tube Works was wholly untrue.

On December 9 the officers of the Dowling Blast Furnace Company selected their site at Chattanooga, Tenn. It is about 1/4 mile northeast of the city limits, about 700 yards from Citico Furnace. The plat of ground comprises about 25 acres. The officers of the company were elected at the meeting for organization during October. The officers are: President, Joseph L. Clift; vice-president, W. D. Talbot; secretary, D. W. Hughes; superintendent, John Dowling.

Adam Wagner, assignee, sold on Saturday, by order of court, the Swift's Iron and Steel Works, in Newport, Ky. The real estate, machinery, material and stock sold for \$199,550. It was bought by H. A. Shriver, who is said to represent a company composed of Al. Gehr, Adam Wagner, R. W. Nelson

and others. The property belonged to E. L. Harper, and its paper figured in the Harper trial.

The Lehigh Iron Company, at Allentown, Pa., recently blew out their No. 2 furnace, owing to the poor quality of coal furnished and the high price which they were compelled to pay for it. We are in receipt of the following information regarding the above from the company, under date of December 12th: "This furnace we put out of blast principally on account of the coal strike. We could not get good coal, and that we were able to get was at a large advance in price and of very inferior quality, much of it showing by analysis only about 66 per cent. of fixed carbon to 17 per cent. of ash. Good Lehigh coal analyzes 75 to 78 per cent. fixed carbon and only 8 to 12 per cent. of ash. Under the circumstances it was impossible to get a new dollar for an old one, and we concluded to shut down and wait for a settlement of the strike. We have recently put No. 3 Coplay furnace out of blast for the same reason." From other sources we learn that nearly all the furnaces in the Lehigh Valley are suffering great inconvenience, it being almost impossible to secure coal to keep the furnaces in operation, and unless the strike now pending is soon settled a number of other furnaces will be compelled to go out of blast.

Machinery.

The Columbiana Pump Company, at Columbiana, Ohio, have increased their capital stock to \$50,000, and will shortly erect a new two-story brick factory, 40 x 130 feet.

On Tuesday, the 13th inst., a 1000 horse-power Reynolds Corliss steam engine, built by E. P. Allis & Co., of Milwaukee, was put in operation by Warren Springer, 207 South Canal street, Chicago. It will supply power to a number of manufacturing establishments, covering the greater part of the block, occupying space rented from Mr. Springer. The engine has a 34 inch cylinder and a 60-inch stroke, and is claimed to be the largest in Chicago. It operates two large fly-wheels, dividing its power, so as to run machinery in buildings located in opposite directions. Another building will be added in the spring to those already built on the block, and it is expected that the new engine will easily perform the increased service then expected of it.

The Lechner Mfg. Company, of Columbus, Ohio, manufacturers of Legg coal mining machines and rotary power coal drills, and the Roller Chain Belting Company, manufacturers of elevators, conveyors and drive belts for handling coal, ore, grain, &c., have consolidated their interests and will hereafter do all their business under the style of the Jeffrey Mfg. Company, J. A. Jeffrey being president and general manager of the new concern.

L. S. Graves & Son, of Rochester, N. Y., builders of freight and passenger elevators, have issued an attractive catalogue in which they illustrate and briefly describe their specialties. It embraces 65 pages.

The Babcock & Wilcox Company, of New York, report the following recent sales of boilers:

| | Horse-power. |
|--|--------------|
| Bilb Mfg. Company, Macon, Ga. | 203 |
| Corporation of the Cathedral of the Incarnation, Garden City, L. I. | 104 |
| Georgia Lunatic Asylum, Milledgeville, Ga. | 136 |
| W. E. Cameron, Manchester, England. | 30 |
| Antero Arcejo, Lisbon, Spain | 15 |
| Louis Glorieux, Roubaix, France | 166 |
| Hammond & Co., London, for Spain | 104 |
| Arthur Butler, for Moolcharr, Tirhoot, India | 40 |
| Arthur Butler, for Moolcharr, Tirhoot, India | 43 |
| L. Fontaine, La Madeleine les Lille, France | 138 |
| Geo. Richard & Co., Limited, Broadheath, near Manchester, England | 122 |
| W. Clark & Sons, Liverpool, England, third order | 136 |
| Harding Croker, Lille, France | 30 |
| Walker Bros., London, for Ceylon fifth order | 25 |
| M. Kenn-ly, Greyhound, New Zealand | 248 |
| J. & J. Boyd, Shettleston, England, second order | 104 |
| Louis Carrie, Marseilles, France | 51 |
| Cadogan Electric Light Company, London, England | 308 |
| Edison Electric Illuminating Company of New York, for Thirty-ninth street station, third order | 803 |
| A. Gillibert & Co., Marseilles, France | 220 |
| Bay State Sugar Refinery, Boston, Mass., third order | 660 |
| Cowles Syndicate Company, Limited, Milton, near Stoke-on-Trent, England | 281 |

The Wainwright Mfg. Company, of Boston, have recently built an erecting shop at their works at Medford, Mass., containing among the outfit a 6-ton job crane.

Kennedy & Fyffe have leased the old Love foundry at Center avenue and Fifteenth street, Chicago, which has been closed for some time, and are operating it under the name of the Center Avenue Foundry. They will make a specialty of rolling mill and heavy machinery castings, the foundry being fully equipped for turning out large work.

Announcement was made to the trade, under date of December 3, that the firm of Forbes & Curtis, Bridgeport, Conn., composed of William D. Forbes and Roderick P. Curtis, was dissolved by mutual consent. Under the same date Roderick P. Curtis and Lewis B. Curtis announce that they have entered into partnership under the firm title of Curtis & Curtis, to carry on the business of the late firm, Forbes & Curtis, who were engineers and manufacturers of Forbes' patent die stocks, pipe-cutting and threading machines, cutting-off machines, ratchet-drills, steam and gas-fitters hand tools, &c. We are informed that the firm contemplate enlarging their works in the spring to double their present capacity, the change being made necessary by their constantly increasing business.

Hardware.

The factory of Clayton Bros., Bristol, Conn., was entirely destroyed by fire on the 13 inst. Their loss is about \$25,000, with insurance for \$10,000.

The Empire Knife Company, West Winsted, Conn., have just put in the most approved and latest machinery for making solid steel wrought cutlery, forgers the same out under the hammer from rod steel.

The Phoenix Caster Company, of Indianapolis, Ind., have let the contract for the erection of a new brick structure, two stories and basement, 120 x 60 feet, increas-

ing their present manufacturing facilities 66 2/3 per cent. The new building is to replace their present factory, the latter being entirely too small and in many respects unsuited to their present requirements.

M. C. Henley, Richmond, Ind., who is almost the only manufacturer of roller skates in the West, is fully equipped with stock, materials, &c., for the prompt supply of the goods, for which there is evidence of a slowly increasing demand.

The Champion Iron Fence Company, Kenton, Ohio, during the past year have made a number of improvements in their manufacturing facilities. Their foundry has been increased in size, and one of the Yale & Towne traveling cranes has taken the place of the former swing crane. The C. H. Hancock has replaced the old style one and a Corliss engine has been put in. New jail buildings have been added, and steam heat has been put into the fence, machine, jail and other departments. In view of the success of the new patent stairways a room 40 x 80 has been utilized for this branch of their manufacture, and an additional brick building, supposed to be fire proof, has been built for patterns.

Miscellaneous.

The Erie Car Works, Limited, of Erie, Pa., writes us as follows: "The enormous business of the Pennsylvania Company is taxing their equipment to the utmost, and they find that all of their repair shops are not sufficient to keep up their repairs and give them their cars promptly for use. As we have a very large repair department in connection with our works, they very naturally called upon us to help them out, and this we are doing, and expect to turn out not less than 100 cars per week, repaired according to their instructions. This will not interfere with our construction department of new cars. The work is going on there as rapidly as ever, and the demand for cars is simply enormous." The above company have also contracted with the Allegheny Valley Railroad Company for the construction of 150 gondola freight cars, work on which has already been commenced.

At a meeting of the members of the Board of Trade at West Chester, Pa., held recently, the following resolution was unanimously passed: "For the purpose of encouraging industrial enterprise the authorities agree to exempt from taxation for borough purposes for the period of three years all new manufacturing establishments that will locate here, provided they shall give employment to 10 or more men."

A contract has just been executed by Mayor E. C. Gordon, president of the Decatur Land Improvement and Furnace Company, of Decatur, Ala., and A. Hege, president of the United States Rolling Stock Company, for the immediate removal of the immense plant of the latter company from Urbana, Ohio, to Decatur, Ala. This company, it is estimated, will employ over 1000 men in the manufacture of railway cars for supplying Southern railroads. The United States Rolling Stock Company also agree to establish their general repair shops at Decatur, in addition to a manufacture of railway supplies, including switches, frogs, nuts and bolts.

A dispatch from Toledo, Ohio, dated the 15th inst., says: "A big gas well was struck this afternoon at Grand Rapids, 20 miles southeast of this city. The flame is 20 feet high and the capacity is estimated at 5,000,000 cubic feet. The proximity of the new gas field to Toledo assures the success of the Citizen's line, which will undoubtedly be completed some time next year. A petition urging the Legislature to pass an enabling act is receiving signatures of citizens generally. It is proposed to furnish gas at cost to manufacturers."

A dispatch from Ishpeming, Mich., dated the 13th inst., says: "A syndicate of Chicago and Detroit men interested in iron mining closed a bargain to-day for the Argyle iron mine. Don M. Dickinson, Wheaton and other Detroit men are the owners. C. H. De Long, D. W. Wadsworth and James Chad, of Ishpeming, the lessees, get \$30,000, and the Argyle Company get \$220,000."

Alexander Bros., Philadelphia, have just completed two large leather bolts, one for the Brush Electric Light Company, 38 inches wide, three-ply, weight 1311 pounds, and one for United States Electric Light Company, of Pennsylvania, 42 inches wide, three-ply, weight 920 pounds.

The Hampden Watch Company, Springfield, Mass., have deferred the moving of their plant to Canton, Ohio, till late next spring or early summer.

The Tennessee Coal, Iron and Railroad Company placed their order with Allen & Atkinson, of Chattanooga, Tenn., for their outfit of scales for the four new furnaces they are building at Ensley City, near Birmingham, Ala. This is one of the largest orders ever given for scales in this section.—*Tradesman.*

The Acme Mfg. Company, Springfield, Ohio, advise us of the large demand there has been for their improved Packham crimper. They have recently placed in their works a special automatic grinding machine, which greatly facilitates the output.

The Revers Coke Company have been organized, with 1000 acres of land, in Fayette County, near Uniontown, Pa. The members of the company are capitalists of Cleveland, Chicago and Pittsburgh, and the capital stock is \$300,000. James Potter, president of the North Chicago Rolling Mill Company, is president, and this mill will take as much of the coke as can be supplied them. William McCroery, one of the Pittsburgh members, says that it is a new field they are opening up; that engineers are now at work making surveys, and 700 ovens will be built immediately; also that the cost will be almost \$200 an oven, or \$140,000.

The coke plant of the Central Connellsville Coal and Coke Company, in East Huntingdon Township, Westmoreland County, Pa., is now in full operation. The company have 204 ovens at their new plant, the majority of which are in successful operation,

MECHANICAL.

A New Method of Stocking and Reloading Coal.

One of the points of interest visited during the recent Philadelphia meeting of the American Society of Mechanical Engineers

attacks and conveys the coal toward the trestle from which it was originally dumped, at which point it discharges the coal into an inclined conveyor which elevates it to a loading pocket, from which it is tapped into cars. The reloading conveyor is so constructed that it can be swung to the right or left, and is capable of operating on either side; consequently, by locating it between

diagram of special interest. The diagrams from the two ends of the cylinder will be readily recognized, and show no special features other than might be expected with comparatively contracted passages and a leaky piston. A line has been drawn a distance corresponding to 14.7 pounds below the atmospheric line to fix the position of zero or full vacuum, and another corres-

ponding, the operation being repeated on the return stroke. The pressure in the boiler must evidently be less than that due to the crests and greater than that due to the hollows at the ends of diagram, or less than 25 pounds, as indicated by steam gauge.

It is interesting to study why the pressure in the chest apparently rises higher than in the boiler. It does not seem possible that the indication can be due to any large extent to vibration of indicator pencil. A number of diagrams taken at the same time all show the same features. It is believed that the phenomena is due to the vis viva of the steam in the steam pipe. This pipe is 5½ inches in diameter inside and 28 feet long, with six bends in it, counting the changes of direction in the stop-valves. For nearly half the stroke the steam is moving through this pipe at a high velocity, and the motion must be kept up for a little time after the cut-off valve closes to restore the pressure in the chest. This increased pressure causes a return current to the boiler, of which the velocity is checked by the increased pressure there, and an actual fall of pressure in the chest, thus causing motion again in the direction of the chest, where the pressure is again banded up just before the main valve opens at the beginning of the next stroke.

Indicator diagrams taken by the writer from good marine engines generally show an initial pressure only 2 to 3 pounds less than that in the boiler. A vacuum of 10 pounds in the cylinder may be considered the average, though 11 and often 12 pounds are obtained in good compound engines. A steam chest diagram taken in a previous instance from a better class of engine did not prove of special interest, but as there are cases where such a diagram would be of great value, the writer suggests that in future the indication of an engine to ascertain its condition should not be considered complete without taking diagrams from the steam chest and exhaust-pipe in addition to those from the cylinder. The exhaust diagram shows at once the amount of back pressure and the steam chest diagram the available pressure from which the cylinder draws its supply. The steam chest diagram may be particularly valuable to show how the loss of pressure from the boiler to the cylinder is distributed, and to what extent modifications in the shape of the diagram are due to defects in the steam supply.

An Improved Form of Connecting-Rod.

We present on this page an engraving of a new form of connecting-rod designed by Mr. Herman H. Meyer, of the Davenport Foundry and Machine Company, at Davenport, Iowa. The improvement consists in having interposed between the adjustable section of the box and the connecting-rod an interlocking key and wedge, the latter being of a width equal to the thickness of the rod, nearly as deep as the box, and having a tongue or projection depending from the lower edge and extending the remaining distance, so that the sum of the wedge and projection is equal in length to the depth of the box. The key is recessed, and the wedge is adapted to fit in said recess in such manner that a portion of the key overlaps the wedge at each end, and a movement thereof effects a corresponding movement of the wedge. The parts are so disposed that the wedge bears with its whole front surface against the box, and with its rear surface partly against the connecting-rod and partly against the key. Heretofore

strap, and in length to nearly the depth of the box, but sufficiently short to permit an adjustment. The projection *d*, Fig. 2, is of a width equal to the thickness of the key, so as to enter the opening *b* in the lower side of the rod or strap. The combined length of the wedge and projection is equal to the depth of the box, so it can be slipped in sideways behind the box. The key *E* is of ordinary length to project above and below the rod, and is provided with the recess *c* of a length equal to the depth of the box or the combined length of the wedge and projection, and of a depth equal to the thickness of the wedge, so that the wedge will come flush with the key when fitted in the recess, and both bear against the box when adjustment takes place. The key passes through openings *b* and *b'* in the strap, and is seated in a groove, *f*, in the rod. This groove is of a depth equal to the width of that portion of the key directly opposite to the recess, so that when the key is seated in the groove this portion will come flush with the end of the rod against which the wedge rests. In the event of the bearing becoming worn the box can be adjusted by driving upon the key, which, interlocking with the wedge, carries it down with it and forces the box up, so as to take up the wear. Mr. Meyer writes us that they will manufacture the rod for the trade as soon as their works are fairly started.

Safety Boilers.

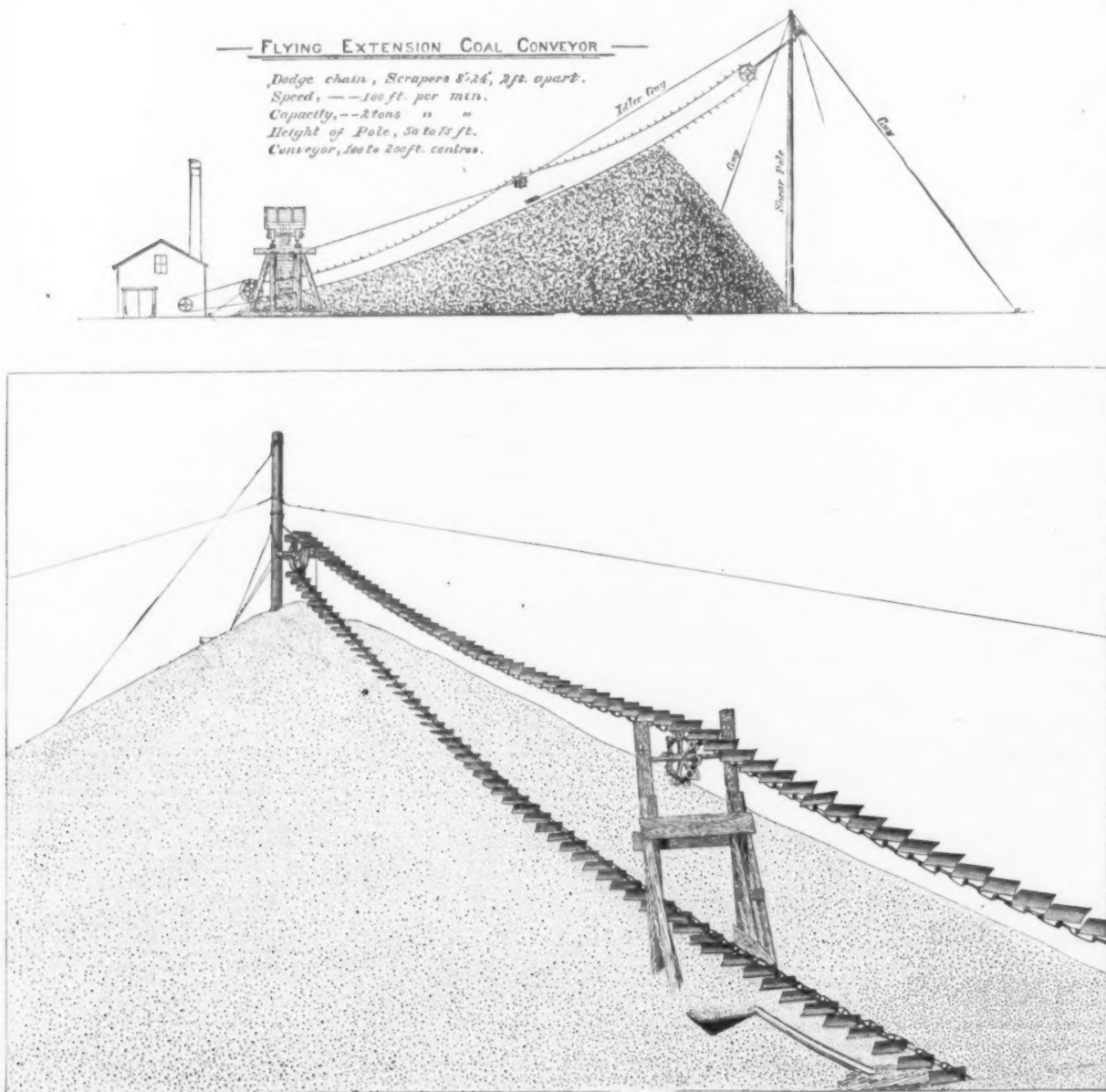
Several genuine and very destructive explosions of so-called safety or non-explosive boilers, says the *Locomotive*, have occurred recently, and it may not be amiss to say a few words upon the subject. To begin with, there is no boiler made that is non-explosive. The most that has been done to render them non-explosive has been to sub-divide the water into small divisions. This diminished the risk of big explosions, and substituted for it the risk of a much greater number of minor accidents, all of which, it should be borne in mind, are just about as likely to scald any one who happens to be near the boiler at the time as would a much larger explosion. No boiler having a connecting or mud drum several inches in diameter, or a steam drum the size of an ordinary boiler shell, can lay any sort of claim to be any safer than the ordinary form of tubular boiler. The subdivision of the water into many small portions means increased first cost of boiler, increased bills for repairs and attendance, and diminished economical performance.

Friction Driving Gear for Dynamos.

Two sets of electric light machinery recently illustrated in *Engineering* were shown provided with friction driving gear for the dynamos, after a manner which, we understand, has been successfully adopted in nearly 200 large installations. The essential feature of this gear is that the dynamo is hung in a cradle which permits it to respond to the action of the screw which puts the grip on the friction wheels, without putting any extra pressure on the bearings of the armature spindle. The friction pinion is made of compressed paper, and runs in contact with a large cast-iron wheel, which also acts as the fly-wheel of the engine. The pressure between the two surfaces is obtained by screwed rods. These rods connect two gun-metal bearings, which are applied to extensions of the crank-shaft and of the armature spindle. Thus the strains due to the pressure between the frictional surfaces are practically confined to the two exterior

FLYING EXTENSION COAL CONVEYOR

Dodge chain, Scrapers 5' 24", 2 ft. apart.
Speed, — 100 ft. per min.
Capacity, — 2 tons " "
Height of Pole, 50 to 75 ft.
Conveyor, 100 to 200 ft. centres.



A NEW METHOD OF STOCKING AND RELOADING COAL.

was the Port Richmond coal wharves, where a novel method of stocking and reloading coal, designed by one of the members, Mr. J. M. Dodge, was seen in practical operation. In connection with the brief outline of the machinery employed, which we gave in our report of the proceedings at that meeting, the following details will prove interesting. They were given in a paper by Mr. Dodge, presented at one of the sessions. The conveyers employed are of two varieties: The first, called the flying extension, consists of an endless chain, to which are attached flights or scrapers, forming a chain conveyor, at the lower end of which is a sprocket-wheel situated under the railroad track, and the other end passing around a traction-wheel secured at the upper end of a pole, which is held in an upright position by suitable guys. The annexed engravings illustrate the arrangement. The conveyers of this kind which are now in use are about 150 feet long, with the upper end located from 50 to 75 feet above the ground. The scrapers are 8 x 20 inches in size, and are placed at intervals of 2 feet on the conveyor chain. There is no support for the lower strand of chain between the foot and head wheels. The upper strand is supported on idler-wheels at intervals of 50 feet. These wheels are either suspended on wire cables or supported by light trestle-work, if convenient. The province of the flying extension is to take coal from the dump situated above the lower end and convey it toward its head-wheel, thus forming a pile of coal, the general shape of which is conical, with the apex under the lower strand of chain, and if the conveyor is fed until it has conveyed coal to its upper end the apex will be directly under the head wheel, forming a pile, say 65 feet high and 300 feet across its base, and containing about 20,000 tons. The pile of coal so formed is in the best possible condition to be reloaded, as there is no trestle-work or other timber obstruction, excepting the pole, in it. In the event of it being advisable to use the same apparatus at another place after its having built one pile, the only portion remaining in the pile would be the pole, the value of which would be about \$15. The apparatus described has a capacity of about 2 tons per minute, and this could be increased almost indefinitely, if required. It is difficult to make a comparison between the cost of stocking coal by this method, and the ordinary plan of using hand labor after the space under the trestle has been filled up, because it is practically impossible to make such immense piles of coal by hand. The average cost, however, of stocking coal on either side of a trestle to a distance of, say, 20 feet is about 30 cents a ton, whereas the cost for stocking coal with the flying extension is but a fraction of this amount. There are four of these conveyers now in use at the wharves of the Philadelphia and Reading Railroad Company, at Port Richmond, Philadelphia, and others in process of erection.

For reloading the coal into cars after it has been stocked, a conveyor is used which is so constructed that it may be moved sideways toward the base of the pile, and kept running continuously while it automatically

two flying extensions it would be able to reload the coal stocked by either of them. By means of the flying extension and reloading conveyers it is possible to store immense quantities of coal on vacant land at some distance from the sea-coast, and cheaply reload it and deliver it at tide-water as called for, instead of storing coal under expensive trestle work and upon valuable dock property.

An Interesting Indicator Diagram.*

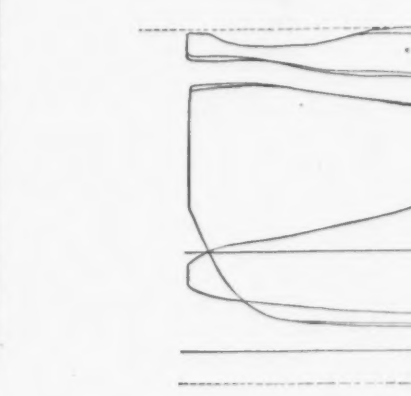
BY CHAS. E. EMERY, PH. D.

During a recent inspection designed to ascertain which of the older vessels of the United States Revenue Marine Service should be replaced, the writer, when steaming over historic waters covered by the guns of Sumter and Moultrie, on the United States Revenue Steamer McCulloch, noticed that the exhaust dragged and observed that the steam chest was quite small for the size of the cylinder. Instructions were given to test the piston, and to make some slight modifications in the piping, to enable indicator diagrams to be taken, not only from the cylinder but from the steam chest and condenser. A sample diagram, as taken by Assistant Engineer E. G. Schwartz, U. S. M., is herewith presented.

This particular vessel was originally a large tugboat, transferred from the navy after the war, built up to form quarters for a boarding revenue cutter and afterward lengthened to increase the accommodations. The engine was of the vertical inverted type, with cylinder 30 inches in diameter and 30 inches stroke of piston. This size of cylinder had evidently been placed on a frame built for a smaller engine and the valve chest retained of the same size as was ordinarily used on the smaller cylinder. The cylinder ports were only 14½ inches long and 2 inches wide. There was an independent cut-off on the back of the main valve, operated by right hand and left hand screws, the main valve being operated, as is customary, by a link motion for reversing. The indicator was of the Richards pattern, old type.

The speed of a marine engine may vary perceptibly from one revolution to another on account of slight movements of the vessel, so it is rare to have the diagram of one stroke follow the previous one precisely. The double lines in the diagram are due principally to this cause, although there are defects due to the indicator itself and the string connection, which, however, are not of great importance in relation to the purpose in hand. With the light spring used all defects are greatly magnified. The hull of the vessel was unsound, and the machinery was being run with such repairs only as were absolutely necessary, until a decision was reached as to the advisability of general repairs, so the report that on trial the piston was found leaky and the main valve somewhat so was not surprising. This feature, however, together with the conditions due to proportions of parts, make the evidence of such defects in the

ponding to 25 pounds to show the boiler pressure as indicated by the gauge. The horizontal line above the absolute zero was drawn by the indicator when connected with the condenser, and shows the so-called "vacuum" in the latter to have been 11.3 pounds, corresponding to 23 inches of mercury, or 2 inches less than indicated by the



AN INTERESTING INDICATOR DIAGRAM.

vacuum gauge, which was probably incorrect. The vacuum in the cylinder is, however, much less than this, or at the lowest point of the diagram only 8.5 pounds. The upper diagram shows the pressure in the steam chest at different parts of the double stroke. As will be observed, the pressure in the chest drops abruptly several pounds when steam is admitted to the cylinder, then

the box has been adjusted by a key driven up by set-screws. In such wise the key is often forced out of shape by the great pressure against it, the bearing surfaces being small. If a wedge only is used, set-screws or bolts are necessary for adjusting it, and cannot be adjusted while the engine is in motion, which is frequently required. A key, on the other hand, can be moved

bearings, and as these are not connected to the framework of either engine or dynamo their wear does not throw other bearings out of line.

A Single-Crank Compound Engine.

In one of our English exchanges we found a short time ago illustrations of an ingenious form of compound engine, having but a

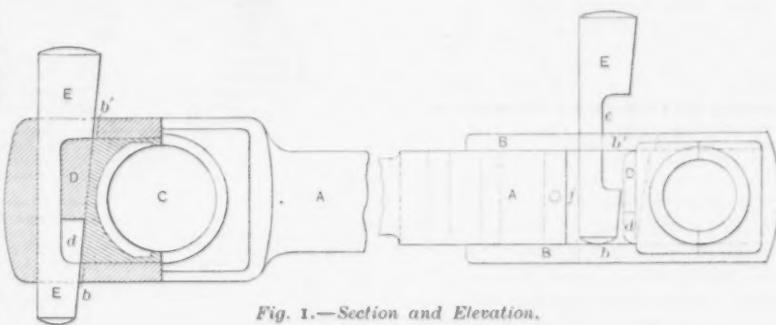


Fig. 1.—Section and Elevation.

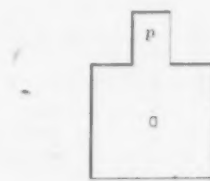


Fig. 2.—Front View of Wedge.

AN IMPROVED FORM OF CONNECTING ROD.

falls still more, so that the line runs nearly parallel to the steam line of the diagram, which of itself shows a fall of pressure due to "wire drawing" but near the point of cut-off the pressure in chest rises rapidly, and at about ¼ stroke runs for a little distance evidently higher than in the boiler, then falls lower than boiler pressure near end of stroke, and rises again above it slightly before the return steam stroke com-

while the engine is in motion or at rest. According to Mr. Meyer's design the connecting rod may have either a solid end, provided with the usual opening *C* for the reception of the boxes, or the strap secured by bolts. The adjustable section of the box may be located at either end of the opening, and has its straight side inclined. The wedge *D*, placed against the box, is equal in width to the width of the connecting-rod or

single crank and being without dead points, the pistons moving in opposite directions. The high pressure cylinder was placed above the low-pressure cylinder, and had its piston-rod coupled to the crank through cast-steel twin beams and a connecting-rod, while the low-pressure cylinder had a connecting-rod arranged in the customary manner. The twin beams were unequal ended, and had gudgeons cast solid with them. The longer

* From a paper read at the Philadelphia meeting of the American Society of Mechanical Engineers, November 28 to December 2.

arms were connected to the crosshead by adjustable links, while the angle of the beams was such that the engine could start with the crank in any position, and creep round under steam at a rate as low as $3\frac{1}{4}$ revolutions per minute.

Steam was admitted to the high-pressure cylinder, which was 13 inches in diameter by 6 feet 3 inches stroke, by Corliss valves, and exhausted direct into the low-pressure cylinder through grid ports through which the upper cylinder was completely drained at each stroke. There were separate Corliss exhaust ports at each end of the large cylinder. The patterns were arranged so that a third cylinder could be attached in tandem fashion and connected to the low-pressure piston-rod, in order to provide for triple expansion. By means of a pair of twin engines quadruple expansion could be obtained. The engine was built by Messrs. Bradley & Craven, Wakefield, England.

A New Form of Tank Heater.

Messrs. Goulds & Austin, 167 and 169 Lake street, Chicago, Ill., are turning out a new form of tank heater which they call the Volcano, and a sectional view of which is given in the accompanying engraving. As its name implies, the device is designed for heating water tanks so as to prevent freezing up in cold weather, and also to make the water more agreeable to stock, which is to be supplied with it, the latter often refusing absolutely to drink ice cold water.

The function of the heater will be readily understood from our illustration. The air passes down through pipe A and underneath grate C, the smoke passing out through opening E, through passage F, under plate B, through passage G, and through chamber H to chimney I. The arrows indicate the direction taken by the smoke and heated gases. A glance will show that the partitions behind and beneath the grate are so arranged that the circulation is perfect, inasmuch as the heat is obliged to pass down behind the partition F and underneath the plate B before it can pass out of the chimney. This arrangement also does away with any dampers that might otherwise be necessary. Strips of asbestos packing are placed in the seam of the drum, this seam being placed behind the air space H, thus preventing its unsoldering should the water fall below high-water mark; that any part of the seam in the drum would be unprotected by water. The iron rim is put on with stove bolts, and the lugs for fastening the heater in the tank are attached independently, so that they can be replaced at a cost of only a few cents should they from any cause be-

forced through the tubes to the opposite end of the heater, thence back through the next tube again to the opposite end of the heater, then back, going and returning as shown by the arrows in the tubes and in the manifold at Q, until it has made the entire circuit of all the tubes, when it passes out of the heater through the pipe B, following the course indicated by the arrows through the pipe B B. The globe valve between C C being closed, it is forced into the cross; fol-

ber of holes are to be drilled in a lathe the lathe-hand can drill every piece in the center without the fear that they are going to be untrue when taken out of the chuck. It will steady the drill so that it will be impossible for it to move from the center of the work after once started, as is very often the case, when the center is found by a fine pointed center tool, or where the drill is steadied by the butt end of turning tool. In starting a drill it is only necessary to put the

The Old Navy.

Commodore T. D. Wilson, Chief of the Bureau of Construction and Repairs, has submitted his annual report to the Secretary of the Navy. In view of the additional duties devolving upon the Bureau in connection with the designing and building of new vessels, he asks that an Assistant Chief of the Bureau be authorized by law. He renews his recommendation that two new

tractive resistance, when full loaded, of about 1500 pounds. It weighs, light, about 15 tons. It is fitted with a Sprague motor—the first electric motor employed for this purpose—and the gearing is supplied by the Yale & Towne Mfg. Company.

Meeting of Metal Manufacturers.

The second annual meeting of the Manufacturers' Association of Brass and Iron Steam, Gas and Water Work was held on the 13th inst. at the Hotel Richelieu, Chicago. Aaron T. Foster, of New York, presided, and S. L. Morrison, of New York, acted as secretary. Among the large concerns represented were Ahrens & Ott Mfg. Company, Bailey, Farnell & Co.; Belknap Mfg. Company; Braman, Dow & Co.; Buckeye Iron and Brass Works; Crane Brothers' Mfg. Company; Davis, Creswell & Co.; Dubuque Brass and Metal Company; Eaton, Cole & Burnham Company; Farnan's Brass Works; Haines, Jones & Cadbury; Haydensville Mfg. Company; Haxton Steam Heater Company; Hoffman & Billings Mfg. Company; Jarecki Mfg. Company; James Jones Mfg. Company; Kinsey & Mahler Company; Robert Leitch & Sons; Lorain Mfg. Company; A. Y. McDonald; John H. McGowan & Co.; Marshall & Co.; Mayor Lane & Co.; McKay Mfg. Company; T. R. McMann & Bro.; McNab & Harlin Mfg. Company; Henry McShane & Co.; N. O. Nelson Mfg. Company; Oil Well Supply Company; Peck Brothers & Co.; The Wm. Powell Company; Rundel, Spence & Co.; Thomas & Wentworth Mfg. Company; the United Brass Company; Walworth Mfg. Company, and L. Wolff Mfg. Company. The morning session was devoted to the reports of officers; the most interesting document being the report of Secretary Morrison. The association, he said, had 81 members, and one of its notable features was its perfectly harmonious relations with its employees. "We have to face," he said, "an outside competition producing 20 per cent. of the annual production of the country in this line, and to contend with jobbers who seek new trade by dividing commissions, and yet we must protect the loyal, honest dealer. No manufacturer of brass goods can sell his product profitably on any scale yet adopted by us unless he can secure an average between the trade price and the double extra preferred price."

The following officers were elected for the ensuing year: Aaron T. Foster, president; George T. Coppins, Edward Worcester, Charles Harrison, vice-presidents; John M. Peck, treasurer; S. L. Morrison, secretary; A. T. Foster, R. T. Crane, E. H. Cole, James Powell, John Harlin, Executive Committee; Edward Worcester, W. H. Douglas, G. T. Coppins, W. H. Hames, C. E. Pease, Charles Jarecki, S. L. Morrison, John Clifford, W. F. Kyle, D. T. Ellis, William McShane, John Farrell, Business Committee. Their second annual banquet was held at the Richelieu in the evening. Covers were laid for 125 in the main banquet hall on the fifth floor. Having finished the feast, President Foster announced the toasts. The first was a toast to "The President of the United States," pledged standing and without any speech in response. Next came "Our Association," responded to by E. H. Cole, of New York. "The City of Chicago—the Western Metropolis and Pride of Our Country," was responded to by R. T. Crane. "The New England Association of Jobbers," response by Col. Charles W. Wilder, of Boston. "The Booming West, the Yankee's Paradise," response by N. O. Nelson, of St. Louis. "Where, Which and Whither," response by John Reid, of New York. "Our Milwaukee Guest," response by George W. Peck. "The Age of Brass," response by James Powell, of Cincinnati. "The Malleable Iron Association," responded to by George Coppins, of Boston. "The Cast Iron Fittings Association," response by Senator Pearce, of Kewanee, Ill. "The Ladies and the Babies, Our Producers and Consumers," responded to by Charles Belden, of Chicago. "The Army and Navy, Our National Defenders," response by Col. J. G. C. Lee. "The Association of Master Plumbers of the United States," responded to by Mr. Rupert Colman, of Chicago.

Another session was held on the 15th inst. The business committee reported regarding a communication from the Master Plumbers' Association, recommending that they stand on the same basis as other jobbers. They also propose to admit any one in the country to the benefit of dealers' discounts, providing his purchases annually from members of the association shall be not less than \$5000, any purchases in excess of that sum up to \$50,000 per annum to be increased in discount pro rata upon each \$1000. The maximum of all purchases is to be \$50,000, no further discount being allowed beyond that. This covers all purchases for 1888.

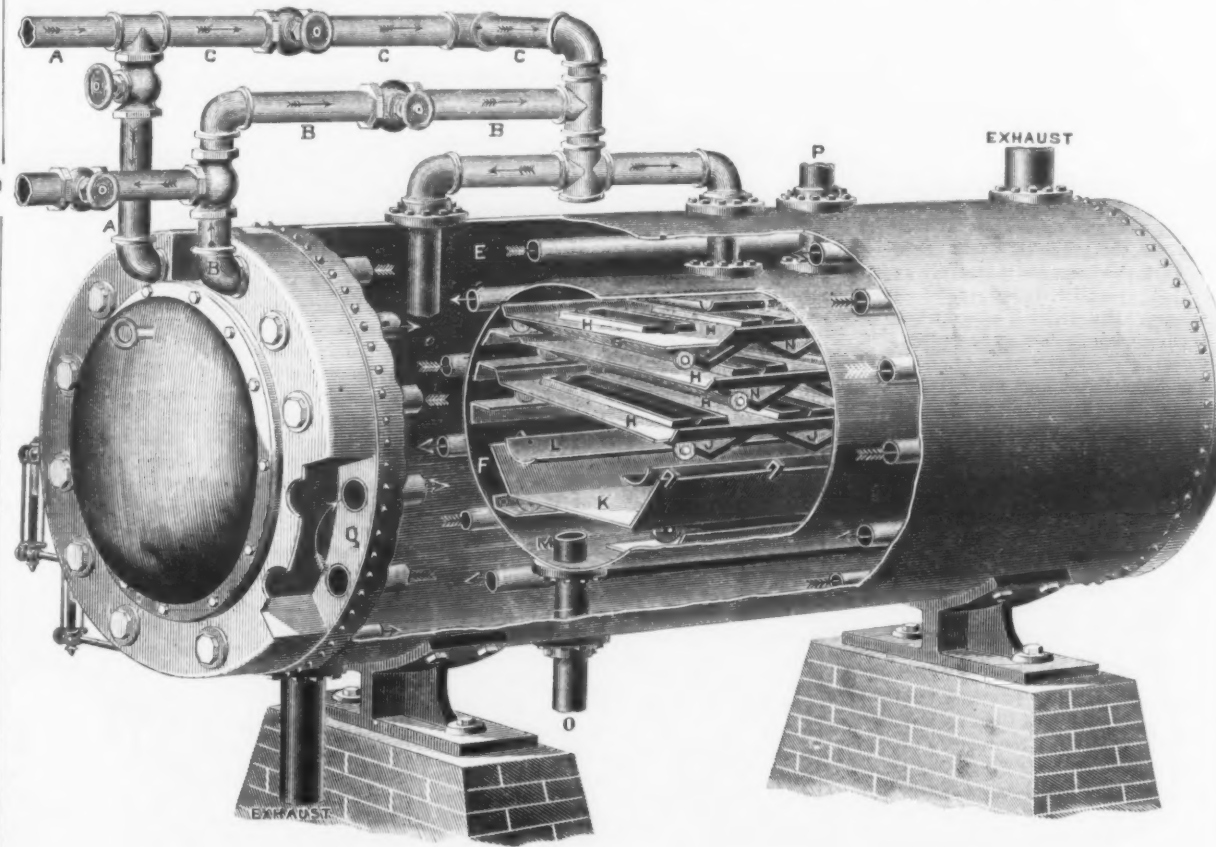
In view of the enormous advance in copper a general advance in prices of 25 per cent. was agreed upon. The arrangement of the schedule and rules for settling was left to the secretary. It was resolved that action should be taken to call together the business committee should spot cash lake copper at any time go to 20 cents a pound.

A committee consisting of N. O. Nelson, St. Louis; James Powell, Cincinnati, and John Farrell, Pittsburgh, was appointed to wait on Congress and protest against any reduction in the tariff on imported copper.

The next annual meeting is to be held in New York the second Wednesday of next December.

It has finally been decided that the Wooten dirt-burning engines on the Philadelphia and Reading Railroad, whose poor performances have long been commented upon, must go. They have been the most expensive feature of the road's equipment, and the present management has determined to substitute standard boilers for the Wooten fire boxes as soon as the latter are worn out. Several of the engines have already been changed at the Reading shops and the others will be altered as rapidly as possible.

The curvature of the earth is such that a straight line 1 mile long would be 2.04 inches from the surface at either end.



COMBINED LIVE AND EXHAUST STEAM HEATER AND PURIFIER.

Built by W. C. Armstrong & Co., Springfield, Ohio.

lowing the course indicated by both arrows, it passes down through the space between F and E, and into the live steam heater F, in two streams, falling on the pan H H. The exhaust from the engine enters the space between the two shells F and E at the bottom of one end, through the pipe marked "exhaust," and circulates all around the tubes, thereby heating the water in the tubes up to a point fully as hot as the exhaust steam itself.

The live steam-heater F is connected to the boilers by means of the pipes P and O, and is, of course, under boiler pressure after the water has been discharged on the pans H H. It fills these to the depth of the slot in the tops. It will be observed that the top of the pan is bent toward the water, which allows the latter to run over the edge of the pan in a thin sheet, until it comes to a point in the side of the pan, where the latter flares toward the bottom, when the water turns and flows down the outside, finally falling on the precipitators J, running in a thin sheet over them and reaching the pan K. It runs out under the plate L and over the sides of the pan K, falling on the bottom shell F, down through pipe O, and into the boiler below the water line. The water is heated to a high temperature, and the impurities precipitated by evaporation will adhere to the pans and precipitators; the heavy matter which does not adhere to the sides of the pans will settle in the bottoms or in the space at M, at the bottom of the heater between the top of the pipe O and the bottom of the shell F. The lighter matter that has not adhered to the pans N or precipitators J is caught by the skimmer L. The water gauges on the end and at the side show the depth of the water in the live steam-heater, and the depth of water of condensation coming from the exhaust steam-heater.

An Improved Pulley Covering.

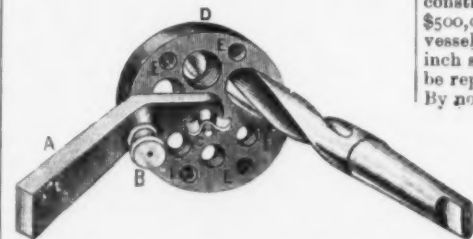
We have just received from the National Pulley Covering Company, of Baltimore, Md., a sample of an improved form of covering for pulleys which they are putting on the market. It is designed to remedy the evil of slipping belts and to save the power ordinarily lost from this cause; its advantage over leather and rubber coverings being claimed to be greater gripping power on the belt and less wear, since no rivets, as in the case of the former, are used in securing it. From all appearances, it seems to be easily applied and simple in character, consisting merely of a cork mixture applied to a burlap backing, the cork apparently being ground fine before mixing with the other ingredients. The burlap backing has a coat of cement, soluble in water. When applying the covering the cement side is moistened and the covering may then be run on under the belt, and after having been allowed to stand for 48 hours, is ready for use.

The importance of a preparation of this kind is immediately apparent, a gain of power not only being assured, but the straining of belts and shafts, and heating of journals in consequence being avoided. The covering, we are told, has been adopted by the Frick Company, of Waynesboro', Pa., for use on all their machinery. Large amounts have also been supplied to W. E. Hooper & Sons' cotton mills, Baltimore; Matthai Ingram & Co., tinware, Baltimore; David Pettit & Co., iron workers, Philadelphia; Gaar, Scott & Co., machinery, Richmond, Ind.; the Deere & Mansur Company, of Moline, Ill.; the Phoenix Horse-shoe Company, of Poughkeepsie, N. Y., and others.

Drill Guide and Steady Rest.

We annex an engraving of a drill guide and steady rest just brought out by the Energy Mfg. Company, of Philadelphia, Pa. The tool was designed so that when a num-

ber of holes are to be drilled in a lathe the lathe-hand can drill every piece in the center without the fear that they are going to be untrue when taken out of the chuck. It will steady the drill so that it will be impossible for it to move from the center of the work after once started, as is very often the case, when the center is found by a fine pointed center tool, or where the drill is steadied by the butt end of turning tool. In starting a drill it is only necessary to put the



Drill Guide and Steady Rest, Made by the Energy Mfg. Co., Philadelphia, Pa.

this tool as the best workmen. It will keep the drill from shifting when blow-holes are in the castings. The plates and shanks are made from the best cast-steel, and can be attached to any size lathe.

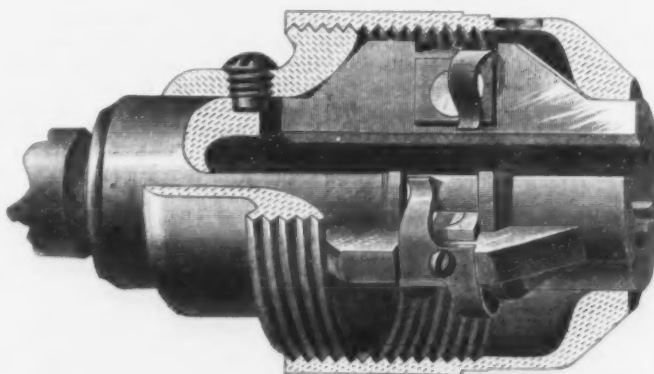
The Ellinwood Drill Chuck.

The Standard Tool Company, of Cleveland, Ohio, have just put on the market a new drill chuck of which we show a sectional perspective, the engraving clearly explaining its construction. The chuck will hold either

vessels of about 1000 tons each be built to replace the training-ships Saratoga, Jamestown and Portsmouth, which cannot possibly be kept in service much longer, and he asks that special authority be given for the repair of the historic sloop of war Hartford at a cost of \$175,000. Relative to the adaptability of the single-turreted monitors to coast and harbor defense, Commodore Wilson says:

"They are now a considerable expense to the navy, as they must be taken care of, and, not being in proper repair, they are of no use to the country. If these vessels are to be kept on the naval list they should be placed in perfect repair and be fitted with such modern rifles as they are capable of carrying. Within six months all of these vessels could be put into the same state of efficiency as they were at the time of their construction, at an expenditure of about \$500,000. This would give 13 coast-defense vessels actually available, armed with 15-inch smooth-bore guns. These guns could be replaced as rapidly as possible by rifles. By no other means could the same amount of money be spent to give the country such a valuable return."

Tables attached to the report show the exact condition of every vessel in the navy. Of the wooden vessels it is said: The Trenton, launched in 1876, represents the latest and best type of wooden steam cruiser, and will be useful and valuable as a cruiser for several years to come. With the Omaha and Vandalia, second rates, she can probably be continued in the service nine years longer; the Lancaster, with new boilers, six years; the Brooklyn and Richmond, five years, and the Pensacola, three years. Of the third rates the Mohican can be continued in service nine years; the Adams, Alliance, Essex, Kearsarge, Enterprise, Tallapoosa, Yantic and Nipsic, for five years; the Juniata, Ossipee, Swatara, Galena and Marion, four years longer. The Quinnebaug and Iroquois will probably be condemned by law on sur-

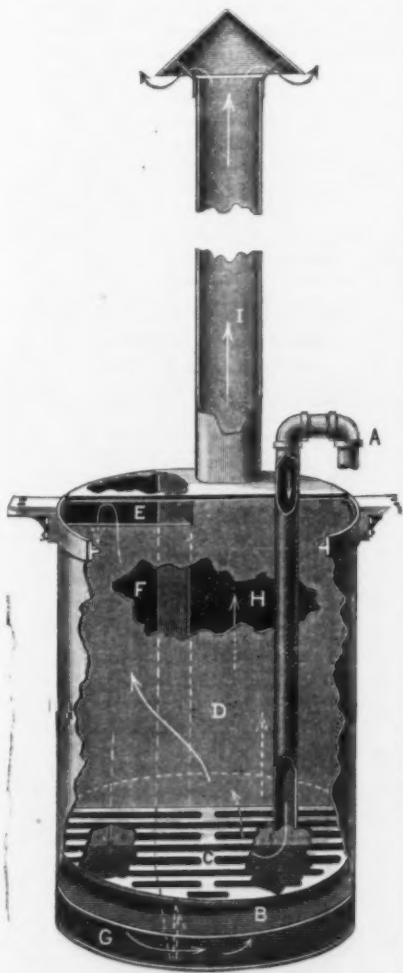


New Drill Chuck, Made by the Standard Tool Co., Cleveland, Ohio.

straight, taper or square shank drills or tools with equal rigidity, and is claimed to always run perfectly true. The jaws are of best tool steel, carefully hardened. All parts are interchangeable. A hole runs entirely through both sizes, so that they can be threaded to fit lathe spindles. By using taper shank drills, as large as $\frac{1}{2}$ inch can be held in size No. 1, which will also hold straight shanks up to $\frac{1}{4}$ inch. Size No. 2 will hold straight shanks up to $\frac{1}{4}$ inch and taper shanks to $\frac{1}{4}$ inches diameter.

vey. It will thus be seen that in three years, we shall have 21 of these vessels remaining, in six years only four, and in nine years the entire wooden navy will have disappeared.

The Railway Review, in a recent issue, presented illustrations with a full description of an electric transfer table building at the shops of the Chicago, Burlington and Quincy Railroad, at Aurora, Ill. The table is 325 feet long by 66 feet wide and has a



Tank Heater, Made by Messrs. Goulds & Austin, Chicago, Ill.

come broken. The heaters are made of heavy galvanized iron, and owing to the system of circulation adopted are claimed to be specially economical in fuel.

Combined Live and Exhaust Steam Heater and Purifier.

We show on this page a sectional perspective of a new live and exhaust steam heater and purifier built by Messrs. W. C. Armstrong & Co., of Springfield, Ohio.

It is composed of two shells, F and E, the latter being riveted at each end to the cast-iron heads. The shell F is also riveted at each end to the same cast-iron head, but on the inside of it, thus leaving a space of 10 inches between the shells. The tubes shown in the space between the shells E and F are expanded into the inner plates of the cast-iron manifold, as at Q, and directly opposite these tubes, in the outer plate of the manifold, are holes with brass plugs in them, which can be removed, and through these holes the tubes can be scraped out if necessary. In the inner shell F are a series of pans, set into large pans, H H. These pans H have rims 3 inches deep. The angle shaped plates J J J and L are the precipitators. The water is fed cold through the pipe A, and the globe valve at C being closed, passes down, following the course indicated by the arrow, through the pipe A, entering the heater at the elbow just below A. It is

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, DECEMBER 21, 1887.

The demand for most classes of Pig Iron for home consumption has continued active, and the belief is general that a still larger business will be experienced during the early portion of 1888. Warrant speculation has been erratic, with a decline on Scotch to 42/2, followed by a reaction to 43/2. The American demand is moderate, due, it is thought here, to possible tariff changes. Maker's prices are more settled on Scotch and Hematite Pigs and a shade lower on Cleveland. Welsh Bars are again higher, and 5/ advance is quoted on Black Sheets.

There has been a continued active demand for Steel for shipbuilding purposes. Orders for new steamships, representing a total tonnage of 80,000 tons, have been placed recently. There is also more activity in Steel Blooms, Billets, &c.; some orders for Blooms, for the American market, 1888 delivery, are said to have been placed. Prices have, however, shown no further change. Messrs. Bolckow, Vaughan & Co. have secured the Victorian order for 43,000 tons of Steel Rails; the price is not stated. In most sections makers are again quoting 4/ 5/ for standard sections. Spiegeleisen is higher.

There has been no material change in the situation of the Tin-Plate trade. Inquiries from the American market are reported as somewhat larger than last week, some of which have been placed at prices a shade under those generally asked a week ago.

The situation in the metal trade is without remarkable change, except that stocks of Copper show a further decline, thus imparting additional strength to the market for that commodity. Transactions in Furnace Material have been restricted by the sharp advance in cost. Messrs. James Lewis & Co.'s record of sales for the past fortnight include 200 tons Montana Matte at 14/ 1/ unit, December and January shipment. There has been more activity in Lead, and Spelter has again advanced materially.

Scotch Pig.—Maker's prices have been modified somewhat, with the result of a quite active business.

No. 1 Coltness, f.o.b. Glasgow, 53/6
No. 1 Summerlee, " " 52/6
No. 1 Gartsherrie, " " 47/3
No. 1 Langloan, " " 52/3
No. 1 Cambro, " " 47/3
No. 1 Shot, " at Leith, 49/6
No. 1 Glenarnock, " Ardrossan, 48/6
No. 1 Dalmellington, " " 45/6
No. 1 Eglinton, " " 45/6

Steamer freights, Glasgow to New York, 10/; Liverpool to New York, 10/ 12/6.

Cleveland Pig.—Prices have reacted under free offerings, and the market has a somewhat unsettled appearance. No. 1 Middleboro', G. M. B., 35/6; No. 3 do., 33/6, f.o.b.

Bessemer Pig.—The high prices asked last week have been modified somewhat, and a larger business has resulted. West Coast brands, mixed numbers, 47/6, f.o.b.

Spiegeleisen.—Demand has shown more activity and prices are stronger. English 20% quoted at 72/6, f.o.b.

Steel Rails.—Continued good demand has led to an advance in prices. Standard sections, 4/ 4/5, f.o.b.

Steel Blooms.—The demand is fairly active and prices strong. We quote at 75/ 77/6, f.o.b., for 7 x 7.

Steel Billets and Slabs.—A firm market reported, with demand good. Bessemer 2 1/2 x 2 1/2 inch Billets, 4/4 @ 4/ 2/6, and Nail Slabs, 4/4 @ 4/ 2/6, f.o.b.

Steel Wire Rods.—There has been more activity and prices are stronger. Mild Steel, No. 6, quoted at 25/ 17/6 @ 26/6, f.o.b.

Old Rails.—Sellers very firm, but the demand only fair. Tees quoted at 22/ 15/ @ 22/ 17/6, and Double Heads, 22/ 17/6 @ 23/6, f.o.b.

Scrap Iron.—Very little doing and prices without change. Heavy Wrought, 42/6 @ 45/6, f.o.b.

Crop Ends.—The market steady, but quiet. Bessemer quoted 22/ 5/ @ 22/ 10/ f.o.b.

Tin Plate.—There is a fairly active demand at the modified prices. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade, 18/6 @ 17/6
IC Bessemer steel, Coke finish, 15/ @ 15/3
IC Siemens, " " 15/3 @ 15/6
IC Coke, B. V. grade, 15/ @ 15/3
Charcoal, Terme, Dean grade, 14/ @ 14/6

Manufactured Iron.—Trade active in most lines, and prices higher for Black Sheets and Welsh Bars:

Staff, Ord. Marked Bars, 6 10 0 @ 7 10 0
Common, " " 4 17 6 @ 5 0 0
B's sheet, singles, 6 10 0 @ 6 15 0
Welsh Bars (at Wales), 4 12 6 @ 4 15 0

Tin.—Trading moderate, but prices held firmly. Straits closed at spot, 165s, and 145s, three months' futures.

Copper.—Market strong but less active. Chili Bars closed at 281 @ 281 10/; Best Selected, 284s.

Lead.—More activity and a stronger tone to the market. Soft Spanish, 115s 5/.

Spelter.—The demand active and the market strong. Silesian, ordinary, 120 @ 121s.

The contractor who is building the tunnel for the Northern Pacific through the Cascade Mountains reports that the tunnel is now constructed 7300 feet, and that 2600 feet remain to be built. The bore will be completed in May.

Financial.

OFFICE OF THE IRON AGE,
WEDNESDAY EVENING, DECEMBER 21, 1887.

There is a somewhat subdued tone in business circles compared with one week ago, and the volume of transactions is considerably reduced. Prices of staple commodities are steady, but quiet. A more cautious feeling is noticeable pending tariff legislation in Congress and uncertainties respecting the financial future, but aside from this fact the disposition is to close up old accounts rather than enter upon new engagements. Among dry goods jobbers and manufacturers attention is engrossed by an important meeting of the trade to-day, to devise remedies for the evils of long credits, dating bills ahead and other vicious methods. The general outlook, with the exceptions noted, is cheerful. Clearing house reports from 36 cities show a decrease of 25.2%, against a decrease of 13.3% for the previous week. Outside of New York the decrease is scarcely perceptible, dull speculation accounting for the difference. The larger Western cities report December trade to date as exceeding that of last year.

The Stock Exchange markets have been stagnant, though generally strong. Thursday and Friday were without notable feature. The favorable bank statement on Saturday caused a rally, and the best prices were at the close. Monday was excessively dull. Lower prices in London on Tuesday for Americans caused a decline in this market, which was checked by supporting orders. The advance in export rates of 7 1/2¢ per 100 lb was not reflected in the market for the trunk line stocks. To-day the volume of business was scarcely one-third of the average. As Christmas and New Year will fall on Sunday, and the following Monday in each instance will be a legal holiday, it was decided to close the Exchange on the Saturday preceding.

United States bonds closed as follows:

U. S. 4 1/2%, 1891, coupon, 108 1/4 @ 108 1/4
U. S. 4%, 1907, coupon, 132 @ 132 1/4
U. S. 5%, 1890, 119 @ 119
U. S. 5%, 1890, 121 1/4 @ 121 1/4
U. S. 5%, 1897, 123 1/4 @ 123 1/4
U. S. 5%, 1898, 123 1/4 @ 123 1/4
U. S. 5%, 1899, 123 1/4 @ 123 1/4

The tenor of European news is warlike and an outbreak of hostilities on the Russian frontier next spring is predicted in high official quarters. A panic feeling caused a decline in Government securities in Vienna and other large money centers. Subsequently there was reaction and American railroad securities improved in London under buying for investment. How a war in Europe would effect American trade is already discussed in commercial circles. It is commonly reasoned that while some interests would suffer, the advantages would be in favor of the United States, in many ways. While cotton exports would receive a serious check, the exports of petroleum would receive a strong impetus in case the markets of Germany were closed against Russia. Grain and provisions, too, would be in extraordinary demand, and on account of the absorption of able-bodied men for military operations it could hardly fail that American industries would receive a strong stimulus. Manufactured goods, and especially arms and ammunition, would find a wide market. With reference to American securities good Wall street authority says: "The first effect of a foreign war on our stock market would naturally be a decline in prices. The second and more permanent effect would be a sustained rise. Our securities are largely held abroad, and hostilities there would unsettle and depress foreign bourses, thus precipitating liquidation in 'Americans,' as well as in the home securities of the powers involved. As soon as the normal conditions of war became established, however, foreign capital would seek safe as well as profitable investment here, and this, with the stimulus which war imparts to general trade and speculation, would result in a boom at the New York Stock Exchange. The effect on our other markets—as wheat, corn, provisions, pork, beef, cotton and iron—would be immediately and permanently favorable, as a foreign demand for all these products would be created at once and our exports largely increased."

The weekly bank statement showed important changes, there being an increase of \$1,721,200 in surplus reserve, which now stands at \$7,928,400, while the loans contracted \$2,682,400 and the specie is up \$724,000. The heavy decrease in loans is due to the limited demand for money for Stock Exchange purposes and to voluntary liquidations in settling accounts. Altogether it is the best statement for months, and gives an assurance of easy money for some time to come. Although the interior movement is diminishing, the increased shipments South offset the receipts from the West. In Chicago the demand for money is greater than the supply, inasmuch that some 7% loans have been called to strengthen the banks. Funds are wanted not only by packers but to carry grain in the Northwest. In Boston the banks are doing little beyond supplying the wants of their customers.

The exports of specie from this port during the week amounted to \$596,000, making a total of \$17,586,000 since January 1, against \$46,890,000 for the same time last year, and the imports for the week were \$384,000, making a total of \$39,809,000 since January 1, as compared with \$34,235,000 for the corresponding period in 1886.

The imports of merchandise at this port during the week amounted to \$8,051,000,

of which \$1,900,000 represents dry goods. Since January 1 the total is \$449,004,000 as compared with \$417,773,000 for the corresponding period last year and 378,456,000 in 1885. The exports of merchandise for the week were much reduced, the total being \$5,062,000. Since January 1 the aggregate is \$299,523,000, as compared with \$315,479,000 for the same time last year and \$323,177,881 in 1885. The items include 88,000 barrels of flour, very moderate shipments of grain, 15,500 bales of cotton and 5,400,000 barrels of petroleum.

The report of the Director of the Mint for the last fiscal year contains some statistics relating to the production and consumption of gold in 1886 which are very instructive. The figures given are these:

World's coinage, less recoinage, \$83,050,000
Used in the industrial arts, 48,745,884
Total coined and used, \$131,795,884
World's production, 97,761,000
Apparent excess of consumption, \$34,034,884

NEW YORK.

American Pig.—As yet next season's opening prices have not been named. Mr. B. G. Clarke, president of the Thomas Iron Company, has been ill for a few days, and no announcement has yet been made. As indicating the confidence of some of the makers of this section, we may state that lately the books of some of the New Jersey Magnetite mines were opened at a price for Ore higher than that of last year—in other words, the same price established in July, when an advance was made. Some of the buyers asked that they be given an option at the prices named till the 15th of January; others, and that quite a considerable number, put in their orders. Among the sales reported are a few thousand tons for delivery over the first four months of 1888 by a furnace in the Birmingham district noted for its good quality, and negotiations are pending for large blocks of other Southern Irons. We note also a sale of 500 tons of Gray Forge at a Virginia furnace at \$14 at furnace. We continue to quote No. 1 Foundry, \$20.50 @ \$21.50; No. 2, \$19 @ \$19.50, and Gray Forge, \$16.50 @ \$16.75.

Scotch Pig.—There have been sales to dealers for delivery over the first four months of 1888 aggregating about 2000 tons, and inquiries have been received from the St. Louis district. We quote Coltness, \$22 @ \$22.50; Dalmellington, \$21 @ \$21.50; Glenarnock, \$21 @ \$21.50; Summerlee, \$21.75 @ \$22; Clyde, \$20.50 @ \$21, and Eglinton, \$20 @ \$20.50.

Structural Iron.—The demand for architectural purposes has held out longer than usual, and a good deal of bridge-work is still coming up. We note the taking by a leading bridge company of a contract involving 2000 tons of material. Bridge Plate is weaker, being offered at 2 1/2¢. The output of Beams this year is expected to come close to 100,000 tons. We quote for large quantities: Angles, 2.40¢ @ 2.55¢; T's, 2.75¢ @ 2.85¢; Bridge Plate, 2.2¢ @ 2.3¢; Channels and Beams, 3.30¢ base, on dock.

Bar Iron.—The market is quiet, with some indications of weakness. We quote: Common Bar, 1.80¢ @ 1.85¢; Medium, 1.85¢ @ 1.95¢, and Refined, 1.95¢ @ 2.30¢, in round lots, on dock.

Plates.—Advices from Scotland report that lately contracts have been closed for America aggregating 40,000 tons, one order alone being represented as being 10,000 tons. While it is undoubtedly true that a good deal of work in the way of Steel Plates and Bars for bridge-building has gone abroad during the current year, and while it is conceded that American mills cannot meet the figures, about 2 1/2¢ for Plates and a shade under 2¢ for Bars, the reports alluded to are exaggerated. The fact is, that American bridge-builders take large contracts for structures in all parts of the world, one of them having lately bought not less than 12,000 tons of material in the Glasgow market, but this material is not intended for consumption in this country, but goes to other ports. Still the fact remains, after making allowances for the misapprehension alluded to, that American bridge-builders can buy Steel Plates and Bars for our market more cheaply abroad than they can at home, and they are doing it to a considerable extent. The same is true of Steel Boiler Plates, Tank Steel and Steel Sheets, but in the case of these the importation is hedged in with many drawbacks to the consumer. In small lots American Steel is selling at 2.65¢ @ 2.75¢ for Shell; 3.10¢ @ 3.25¢ for Flange, and 3.50¢ @ 3.75¢ for Fire-box. Iron Plates are quoted at 2.25¢ @ 2.30¢ for Tank; 2.40¢ @ 2.50¢ for Shell, and 3.40¢ @ 3.50¢ for Flange.

Steel Rails.—The market is weaker and fairly active, with quite a number of transactions closed and a good many negotiations pending. There are indications, both East and West, that whatever may have been the understanding among the mills, it is not generally lived up to and it seems possible that the efforts to hold at certain prices will be given up, and the safer method of keeping output within the requirements by the allotment system now in vogue will alone be relied upon to prevent demoralization. We note sales during the week under review of about 40,000 tons, among which one lot is reported from Philadelphia of 15,000 tons, sold by the Bethlehem Iron Company to the Lehigh Valley, one lot of 12,000 tons, to a trunk line and another lot of 5000 tons, all sold by Eastern mills. Among the sales is also a lot of 4000 tons to a Western road by

a Western mill, at a low figure, while it is reported, but not confirmed, that an Eastern mill has taken a 10,000-ton order from a Northwestern railroad, and that a sale of 6000 tons has been made to a Southern road. There are a number of large contracts on the market likely to be closed in a short time. Prices are irregular, and while some of the mills quote round figures and apparently make contracts at them, the device of protecting the buyer is resorted to in a number of cases. We quote \$31.50 @ \$33.

Wire Rods.—The market is quiet at \$40.50 @ \$41 for imported Wire Rods at tidewater, with few sales, and as yet little disposition to buy for next year.

Old Rails.—The market has been quiet, and on the whole has retained the features which have characterized it for so long a time. In other words, holders when forced to sell have found it difficult to get fair prices, while consumers when trying to buy had found the market quite bare of cheap lots. During the past few weeks, however, there has been a tendency to pick up cheap lots, and there is now a growing disposition on their part to buy. Manufacturers of Track Material have taken quite a number of orders of late, and there is considerably more business in sight. This will naturally lead to covering on their part, and there are now pending negotiations for round lots of Bridges, D ubles and Tees. We quote a sale of 1000 tons of Tees for the Young-tu-wu district at private terms, and a number of sales are reported at Pittsburgh of Foreign Rails.

Scrap.—The market is dull, with foreign at \$19 @ \$19.50, and domestic at \$19.50 @ \$20, the latter figure asked for a round lot of choice at wharf.

Railroad Fastenings.—Quite a number of orders have been placed lately. We quote: Spikes, 2.25¢ @ 2.40¢, delivered; Angle Bars, 1.90¢ @ 2.10¢, and Bolts and Nuts, 3¢ @ 3.25¢. The annual meeting of the Spike Association is being held in this city to-day.

Metal Market.

Copper.—On Thursday of last week Chili Bars advanced in the London market from 277. 2/6, the closing figures on Wednesday, to 280. 2/6, the sales amounting to 1425 tons, against 925 tons the previous day, while in New York the metal was active and again higher. Sales were made of 900,000 pounds at 17.60¢ @ 17.75¢ for spot, 17.70¢ @ 17.90¢ for December; 17.95¢ @ 18.05¢ for January; 18.05¢ @ 18.15¢ for February; 18.05¢ for March; and 18.25¢ for April. On Friday London rose to 280. 5/6, with sales of 1250 tons, and here an active speculation continued at irregular prices, the sales made aggregating 1,600,000 pounds at 17.75¢ @ 17.80¢ for December; 17.95¢ @ 18¢ for January; 18¢ for February; and 18.10¢ for March. Thenceforward till Tuesday London did not waver from 280. 5/6, the sales during the interval summing up 1000 tons, but it came 280. 7/6 on Tuesday, with transactions of 450 tons. On Saturday dealings reached 750,000 pounds in this city, at 17.80¢ @ 17.85¢ for December; 17.90¢ @ 17.95¢ for January; 18¢ for February; 18¢ for March; and 18.15¢ for May. On Monday there was a slight giving way in the market, with a turnover of 650,000 pounds, at 17.75¢ @ 17.90¢ for January; 17.80¢ for February and 18¢ for March. The market on Tuesday, in spite of the London improvement of 2/6, was dull and easier, 50,000 lb, December, selling at 17.65¢, 150,000 lb, February, at 18.80¢ and 150,000 lb March at 17.90 @ 17.80¢. This morning Chili Bars are cabled from London 281. 2/6, while Best Selected is not quoted over 281. At the Metal Exchange on first call 50,000 lb, December, Copper were sold at 17.70¢, 25,000 lb, January, at 17.70¢ and 50,000 lb, February, at 17.75¢. Export of Pyrites from Spain during the first nine months, 594,779 tons, against 515,094 in 1886 and 630,640 in 1885; of Precipitate, 19,493 tons, against 20,607 and 20,860 respectively. Upon inquiry this forenoon at the office of the Calumet and Hecla Company, we are told that nothing new beyond what we stated at the close of our last report has occurred since.

Tin.—The stereotyped London quotation of 166s, spot, and 145s, three months, during the week, with altogether 475 tons sold, was not calculated to stimulate speculation either way in our market, sales being confined to 20 tons on Thursday last at 33.60¢ @ 33.75¢ for February; 30 tons, April, at 32¢ @ 32.15¢ on Monday, and winding up yesterday at nominally 36.30¢, spot, and 33.60¢, February. To-day the market was featureless and without leading to further dealings, quotations remaining nominally unaltered.

The export of Tin from the Straits Settlements to the United States during the first 10 months was 68,730 piculs, against 59,121 in 1886, 23,863 in 1885, 55,279 in 1884, 99,164 in 1883 and 96,772 in 1882. As per cable message from Gillilan, Wood & Co. to Mr. Charles Nordhaus, East India agent, 89 Water street, New York, Tin shipments from Singapore and Penang during the fore half of this month amounted to only 100 tons to the United States, against 400 during the corresponding period of last year, whereas to England they were 1200 tons, against 700 tons. The total export thence to this country from January 1 to date was 4250 tons, against 3750 last year,

and to England 15,950, against 11,910, together 20,200 tons so far this year, against 15,660 in 1886, an increase of 4540 tons, or, say, 28%. As per mail advices, the Chinese were shipping back Tin from China to the Straits Settlements in order to avail themselves of the high price. Tin Plates.—The spot demand has abated during the week, and as fresh importations begin to complete the assortment holders show a more willing disposition to meet the views of the trade, and the tone is one of greater ease, though there is no quotable change. We quote large lines, P box: Siemens-Martin Steel, Charcoal Finish, \$5.25 @ \$5.50; ditto, Coke Finish, \$5 @ \$5.12 1/2; Terns, \$4.62 1/2 @ \$4.75, and Coke Tins, \$4.90 @ \$5. In Liverpool Coke Tins are 3d lower, being cabled 15/3.

Lead.—The Metal on Thursday last was taken in hand by operators for a rise on the Metal Exchange, and 48 tons January were sold at 5¢, and 116 tons February at 5.10¢ @ 5.12 1/2¢; on Friday 550 tons February at 5.10¢ @ 5.15¢ and 5.17 1/2¢, and 16 tons March at 5.17 1/2¢; on Monday 16 tons, spot, at 5¢, and 16 tons February at 5.10¢; on Tuesday 48 tons, spot, at 5¢ to 5.05¢; 48 January, at 5.05¢, 100 February, 5.10¢, and 100 March at 5.1¢. At private sale hardly anything has transpired during the week; the nominal value of Common Domestic in the street is 5¢ @ 5.05¢, but it would be difficult to place 1000 tons at that figure. At St. Louis the quotation is 4.95¢, and at Chicago 5¢. Export of Pig Lead from Spain during the first nine months, 99,168 tons, against 82,591 tons same time last year and 88,352 tons in 1885. The notable increase will be observed. In London Soft Spanish is unaltered this morning at 21s. 10/6, while English Pig shows quite an advance of 15/6, the same being cabled 21s. 15/6. Lead manufactures are quoted at the following figures: Lead Pipe, 7 1/2¢; Sheet Lead, 8 1/4¢; Tin lined Lead Pipe, 15¢; Block-Tin Pipe, 15¢; Drop Shot, 2 1/2¢ 25 lb bag, \$1.40; do., 5 lb bag, 35¢; Buck and Chilled, 2 1/2¢ 25 lb bag, \$1.75; and do., 5 lb, 40¢.

Spelter and Zinc.—Consumers are seemingly indifferent about replenishing stocks at the higher ruling, and we quote Common Domestic unaltered, 5 1/2¢ @ 5 3/4¢ as to brand, Silesian continues advancing so fast in London that so far as our market is concerned it loses all practical interest, being quoted this morning 221, another improvement of 2¢ for the week. Sheet Zinc remains sustained at 6 1/2¢ @ 7¢, with a good seasonable demand. Export of Calamine from Spain during the first nine months, 20,698 tons, against same time last year 21,140 tons, and 27,616 in 1885.

Antimony.—As per cable dispatch from London, Hallett rose from 242 to 246, and is held in New York at 11¢ @ 12¢, while for Cookson 16¢ is asked.

New York Metal Exchange.

The following sales are reported:

| THURSDAY, DECEMBER 15. | |
|---|----------|
| 10 tons Tin, February..... | 33 1/2 |
| 10 tons Tin, February..... | 33 1/2 |
| 25,000 lb Copper, February..... | 18.00 |
| 25,000 lb Copper, April..... | 18 1/4 |
| 25,000 lb Copper, December..... | 17.80 |
| 175,000 lb Copper, January..... | 18.00 |
| 25,000 lb Copper, February..... | 18 1/2 |
| 25,000 lb Copper, March..... | 18.00 |
| 48 tons Lead, January..... | 5.00 |
| 100 tons Lead, February..... | 5.10 |
| 16 tons Lead, February..... | 5 1/4 |
| 25,000 lb Copper, December..... | 17.90 |
| 25,000 lb spot Copper..... | 17.80 |
| 100,000 lb Copper, December..... | 17 7/8 |
| 75,000 lb Copper, spot..... | 17.90 |
| 25,000 lb Copper, spot..... | 17.60 |
| 50,000 lb Copper, December..... | 17.90 |
| 25,000 lb Copper, January..... | 18.00 |
| 25,000 lb Copper, January..... | 17 3/4 |
| 150 tons Lead, February..... | 5.10 |
| 25,000 lb Copper, December..... | 17.90 |
| 150,000 lb Copper, January..... | 17.90 |
| 25,000 lb Copper, December..... | 17.80 |
| FRIDAY, DECEMBER 16. | |
| 25,000 lb Copper, March..... | 18.10 |
| 175,000 lb Copper, January..... | 18.00 |
| 100 tons Lead, February..... | 5.10 |
| 16 tons Lead, March..... | 5.17 1/2 |
| 50,000 lb Copper, January..... | 18.00 |
| 350,000 lb Copper, December..... | 17 3/4 |
| 25,000 lb Copper, December..... | 17.80 |
| 25,000 lb Copper, January..... | 18.00 |
| 150,000 lb Copper, January..... | 17.95 |
| 25,000 lb Copper, January..... | 17.95 |
| 50,000 lb Copper, February..... | 18.00 |
| 50 tons Lead, February..... | 5.15 |
| 20 tons Lead, February..... | 5.15 |
| 200 tons Lead, February..... | 5.17 1/2 |
| 550,000 lb Copper, December..... | 17 3/4 |
| 100,000 lb Copper, December..... | 17.80 |
| 25,000 lb Copper, February..... | 18.00 |
| SATURDAY, DECEMBER 17. | |
| 50,000 lb Copper, March..... | 18.00 |
| 25,000 lb Copper, March..... | 18.10 |
| 25,000 lb Copper, December..... | 17.80 |
| 50,000 lb Copper, December..... | 17.80 |
| 50,000 lb Copper, December..... | 17.85 |
| 50,000 lb Copper, January..... | 17.90 |
| 400,000 lb Copper, January..... | 17.90 |
| 50,000 lb Copper, February..... | 18.00 |
| 50,000 lb Copper, May..... | 18.15 |
| MONDAY, DECEMBER 19. | |
| 150,000 lb Copper, January..... | 17.85 |
| 25,000 lb Copper, January..... | 17.90 |
| 16 tons Lead, spot..... | 5.00 |
| 16 tons Lead, February..... | 5.10 |
| 50,000 lb Copper, March..... | 18.00 |
| 100,000 lb Copper, January..... | 17.70 |
| 10 tons Tin, April..... | 32.00 |
| 20 tons Tin, April..... | 32.15 |
| 50,000 lb Copper, January..... | 17.85 |
| 250,000 lb Copper, January..... | 17.80 |
| 25,000 lb Copper, February..... | 17.80 |
| TUESDAY, DECEMBER 20. | |
| 100,000 lb Copper, February..... | 17.85 |
| 25,000 lb Copper, March..... | 18.00 |
| 150 tons Lead, spot..... | 5.05 |
| 50,000 lb Copper, December..... | 17.65 |
| 25,000 lb Copper, February..... | 17.80 |
| 100,000 lb Copper, March..... | 17.80 |
| 25,000 lb Copper, March..... | 17.75 |
| 25,000 lb Copper, February..... | 17.80 |
| 32 tons Lead, January..... | 5.05 |
| 100 tons Lead, February..... | 5.10 |
| 100 tons Lead, March..... | 5.06 |
| WEDNESDAY, DECEMBER 21. | |
| 50,000 lb Lake Copper, December..... | 17.70 |
| 25,000 lb Lake Copper, January..... | 17.70 |
| 50,000 lb Lake Copper, February..... | 17.75 |
| 50,000 lb Lake Copper, April..... | 17.85 |
| 100,000 lb Lake Copper, December..... | 17.70 |
| 25,000 lb Lake Copper, January..... | 15.75 |
| The Metal Exchange proposes to list Copper mining stock. | |

Trade Report.

Philadelphia.

Office of The Iron Age, 230 South Fourth St.,
PHILADELPHIA, Pa., December 20, 1887.

Pig Iron.—A very unsettled feeling prevails, and it is no easy matter to harmonize the conflicting opinions which are met with. If we confine our remarks to the position as it exists to day, we should say that there is no particular change, either in price or in the available supply. But every one wishes to catch an insight into the future, as there is an impression that the existing order of things is on the eve of a change. We have no new light to offer, however, but agree with the trade at large that there is nothing for it but to wait and see. Some people are sanguine of an active market and firm prices, while the majority are anything but confident on this point, and it must be confessed that with such information as we can procure the last named seemed to hold the strongest position, but a great deal will depend upon consumption during the first three months of the new year. So far as now appears, the chances are very favorable on this score. Shipbuilding, car-building, bridge work, machine work, &c., is likely to be on a large scale, and it is reported that the Pipe trade, which was of so much importance a year ago, is again assuming large proportions, so that there will undoubtedly be a heavy consumption. But it must be as large as last year to hold prices where they are today, without counting anything for new sources of supply. It is not surprising, therefore, that buyers hold back their orders, although if cost of production is taken into consideration prices are certainly low enough. But at this time it is impossible to form any very definite idea what the relative proportions of supply and demand will be, and that after all is the only solution of the problem. No matter how large consumption may be, if the supply is still larger, prices must yield, and the capacity for supply will assuredly be larger than consumption, although it is not likely to be all utilized. Still it is felt to be more or less of a menace to the market, and nothing like liberal buying can be expected until things are more settled. Looking at the matter from a local standpoint, we should feel inclined to predict a firm market, but there is no doubt whatever that a severe competition will be waged to secure business at current quotations, and as a matter of fact negotiations are in progress to-day for several thousand tons of Southern Iron, which is offered at considerably less money than would be quoted on local brands, and although this class of Iron cannot be sold indiscriminately, it diverts a certain amount of trade, and to that extent has an influence in making quotations for the entire market. To-day's prices are from \$20.50 to \$21 for No. 1 Foundry at tide, \$18.50 to \$19 for No. 2, and \$16.75 to \$17.25 for Gray Forge. Southern Irons in large blocks are offered at about a dollar less money, but in most cases the difference is pretty well lost in taking deliveries ex-ship.

Foreign Iron.—The market is extremely dull, and although prices abroad are hardening, there is not the slightest disposition on this side to make bids. Prices are nominally about \$20, c. i. f., duty paid, for Bessemer, and \$26.75 for 20% Spiegel.

Blooms.—More demand for Domestic Blooms, but at pretty low prices. Asking rates as follows: \$30 @ \$31 for Nail Slabs; \$31.50 @ \$32.50 for 4 x 4 Billets; \$35 @ \$36 for Siemens-Martin. Domestic Blooms as follows: Steel, from \$30 to \$35, f. o. b. cars at mill, according to analysis; Charcoal Blooms, \$53 @ \$54; Runout Anthracite, \$45 @ \$46; Scrap Blooms, \$48 @ \$39 1/2 "bloom" ton.

Muck Bars.—Market quiet, with \$30.50 @ \$31 at mill asked. Small lots taken at these figures.

Bar Iron.—Nothing doing of any importance, and nothing expected until after the holidays. The outlook is said to be favorable for work during next month, a great many inquiries having been sent in, and a great deal of stuff likely to be wanted, but buyers' ideas are way down in prices. Still, if the material is actually required it will have to be taken at some price, and if the mountain refuses to come to Mahomet, Mahomet must come to the mountain. But a good deal will depend on the amount of business offering within the next two or three weeks, as the mills will all be anxious to start up as soon as possible. Skelp Iron is said to be wanted in large quantities, bids having been made for several thousand tons, but at figures which are too far away from the market to meet with immediate acceptance. In fact, prices are all more or less nominal, large consumers making their bids low enough to be perfectly safe, feeling that they can advance bids according to their necessities. Best Refined Bars are quoted at about 2¢, and Grooved Skelp at \$1.95.

Plate and Tank Iron.—The market is in a very unsatisfactory condition, although inquiries have been more numerous, and prospects for business are more favorable than they were a little while ago. But the mills are nearly all through with their orders, and it will require a great deal of

work to give them all a start, and for that reason prices are weak and irregular. Steel especially, owing to the low price at which Foreign Plates are offered. Nominal rates are about as follows: Ordinary Plate, 2.15¢ @ 2.20¢; Tank, 2.20¢ @ 2.25¢; Shell, 2.6¢ @ 2.7¢; Flange, 3.5¢; Fire Box, 4¢; Steel Plates, Tank, 2.6¢; Shell, 2.8¢; Flange, 3 @ 3 1/4¢; Fire-Box, 3 1/4¢ @ 4 1/4¢.

Structural Iron.—A fair amount of new orders have been taken, but nothing very large, except a 4000-ton Bridge order from New England. The mills are still pretty full of work, although in some of their departments they are not as busy as they might be and probably will be after the first of the year. Prices are about as follows: 2.25¢ @ 2.35¢ for Bridge Plate; 2.3¢ @ 2.35¢ for Angles; 2.8¢ @ 2.9¢ for Tees and 3.3¢ for Beams and Channels.

Sheet Iron.—Prices are steady and unchanged at about the following rates on small lots:

| | |
|---------------------------------------|-----------------|
| Best Refined, Nos. 26, 27 and 28..... | 34¢ |
| Best Refined, Nos. 18 to 25..... | 33 1/2¢ |
| Common, 1/4¢ less than the above..... | |
| Best Bloom Sheets, Nos. 26 to 28..... | 4 1/2¢ @ 4 3/4¢ |
| Best Bloom Sheets, Nos. 22 to 25..... | 4 1/4¢ @ 4 1/2¢ |
| Best Bloom Sheets, Nos. 16 to 21..... | 3 1/2¢ @ 3 3/4¢ |
| Blue Annealed..... | 2 1/2¢ @ 3 1/2¢ |
| Best Bloom, Galvanized, discount..... | 60 ¢ |
| Common discount..... | 65 ¢ |

Steel Rails.—Business is still held in abeyance, and only small orders are being taken at quoted rates. Some of the mills have shut down, but others seem disposed to keep running, and intimate that they are prepared to make concessions on the right kind of orders for winter work. This probably means lower prices, although nominal quotations are still \$32 @ \$33 at mill, but very little headway can be made at these figures.

Old Rails.—Nothing doing of any account, and the position shows no change from that of the past three or four weeks. Holders quote \$23 in store for Ts, or \$22.50 for lots to arrive, but buyers are quite indifferent, and mention \$21 @ \$21.50 as their ideas. Sales in the interior of a few hundred tons at about \$24, delivered at mill.

Scrap Iron.—Dull, but with light offerings; prices are fairly steady at about the following quotations: Cargo lots No. 1 Scrap, \$20 @ \$21; carload lots, \$21 @ \$22, or for choice lots \$22.50 @ \$23. No. 2 do., \$14 @ \$15; Turnings, \$15 @ \$16; Old Car-Wheel, \$17.50 @ \$18; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$16 @ 17; do. Borings, \$11 @ \$12; Old Fish Plates, \$27 @ \$28.

Wrought-Iron Pipe.—Business is in excellent condition, and the prospect for the new year is exceedingly bright. Prices are firm and discounts quoted as follows: Butt Welded Black, 47 1/2¢; Butt-Welded Galvanized, 37 1/2¢; Lap-Welded Black, 60¢; Lap-Welded Galvanized, 45¢; Boiler Tubes, 52 1/2¢.

Nails.—Nothing new to report. Trade is quiet and dealers are buying only what they need, as they do not care to stock up at this period of the year. Prices while not quite as low as last year, show no improvement over last week, viz.: from \$2.05 to \$2.15 from store.

Pittsburgh.

Office of The Iron Age, 77 Fourth avenue,
PITTSBURGH, PA., December 20, 1887.

Pig Iron.—There is a fair volume of business in the aggregate, but the demand is still of a hand-to-mouth character, as it always is in December, consumers making it a point to close the year with as little stock as possible. In addition to this the downward turn in prices for some time past has also had its influence in the same direction. Some furnacemen are refusing to make contracts for future delivery at present prices. As compared with the price prevailing when the market commenced to tumble, a couple of months ago, Mill Irons have declined some \$2 @ \$2.50 per ton; Foundry Irons not so much, but they may go off more after the decline in Mill Irons has been checked. It is generally conceded that there is no margin for profit at present prices, and unless there is a change for the better before long a number of furnaces in the Shenango and Mahoning valleys will either bank up or blow out. Cost of production remains unchanged; Ores, coke, freight, &c., are the same now as before the decline in Pig Iron, and unless these are reduced the only alternative for furnacemen is to blow out or bank up. It is thought the price of Coke will drop before long, and the action of the railroads in not having dropped freight rates before this is severely criticized. They did not hesitate to advance rates, but they are very slow about putting them back again, now that the Pig Iron market is in an exceedingly unsatisfactory condition. It is evident that either the cost of production must be reduced or the price of Pig Iron advanced. Quotations may be fairly given as follows:

| | |
|----------------------------|--------------------------|
| Neutral Gray Forge..... | \$16.50 @ \$17.00 4 mos. |
| All Ore Mill..... | 18.00 @ 18.50 " |
| White and Mottled..... | 15.50 @ 16.00 " |
| No. 1 Foundry..... | 12.50 @ 30.00 " |
| No. 2 Foundry..... | 18.50 @ 19.00 " |
| No. 1 All-Ore Foundry..... | 30.25 @ 30.50 " |
| Charcoal Foundry..... | 23.00 @ 25.00 " |
| Cold Blast Charcoal..... | 27.00 @ 30.00 " |
| Bessemer Iron..... | 18.00 @ 19.50 " |

While there have been no sales of Bessemer reported below \$19, cash, it is intimated that round lots can be had at \$18.50, cash.

Muck Bar.—Demand continues light and prices weak, although not quite so low. We continue to quote at \$29 @ \$29.50, cash; no sales reported below \$29, cash, but for a round lot we have not much doubt a seller

could be found at a lower price, as the great point with some mill owners is to keep their mills in operation.

Manufactured Iron.—Orders continue to come forward very sparingly, but this is nothing unusual in December, when a light trade is expected; however, the mills are still in operation, some of them running full, working up old contracts. The indications, however, are that there will be an improvement early in the new year; the outlook is by no means discouraging. Prices are lower, in sympathy with the raw article, and we now quote upon a basis of \$1.85 @ \$1.90 for Bars, 60 days, 2¢ off for cash. Some mills working on specialties have orders booked sufficient to keep them running for some time yet.

Nails.—There is no change in the Nail trade; dullness still continues, and it is not likely that there will be any improvement for some time to come.

Wrought-Iron Pipe.—There is not much new business, but the mills still have about all they can do working on old contracts. Prices remain unchanged. Discounts on Black Butt Welded Pipe, 47 1/2¢; on Galvanized do., 37 1/2¢; on Black Lap-Welded, 60¢; on Galvanized do., 45¢; Boiler Tubes, 52 1/2¢; on Casing, all sizes, 50¢; Two-Inch Tubing, 14¢ per foot, net; Two Inch Line Pipe, 13¢; Eight-Inch Line Pipe, \$1.40.

Old Rails.—The demand continues very light, and there does not appear to be much prospect of any immediate improvement. We are advised of a small sale at \$24, but brokers who make a specialty of the same intimate that a round lot could be bought for less money. A small sale of Old Steel Rails was reported at \$21, delivered at Chicago, the first sale of these reported here for several months.

Billets, &c.—Bessemer Steel Billets are still quoted at \$20 to \$29.50 @ \$30, cash, as to quality, size, delivery, &c., and dull. Nail Slabs dull and nominal at \$29, cash—might be bought for less. Sale Wire Rods (American) reported at \$40. Steel Rail Ends nominal at \$19.25 @ \$19.50, and Bloom Ends at \$19, cash.

Steel Rails.—There have been no sales reported for some time, and it is difficult to give reliable quotations in consequence. The Edgar Thomson Works have shut down indefinitely, throwing a large number of men out of employment. The Homestead Mill stopped making Rails some time ago. It is probable that the former mill will be started up before long again.

Old Material.—The demand for all kinds of Old Material continues light and prices are weak. Sales No. 1 Wrought Scrap at \$20 @ \$21, net ton; Wrought Turnings, \$13.50 @ \$14; Car Axles, \$27 @ \$28; Cast Borings, \$12 @ \$12.50, gross; Old Car-Wheels, \$20, gross; Open-Hearth Steel, \$19.50 @ \$20.

Railway Track Supplies.—Demand continues light, while prices remain unchanged: Spikes, 2.60¢, 30 days, delivered. Splice Bars, 2¢ @ 2.10¢; Track Bolts, 3¢ with Square and 3.10¢ with Hexagon Nuts.

Chicago.

Office of The Iron Age, 95 and 97 Washington St.,
CHICAGO, December 19, 1887.

In nearly every line the volume of business is diminishing in anticipation of the close of the year, when stock-taking will be in order. Prospects are excellent, however, for a heavy trade in January, unless something very unfavorable should occur in the meantime.

Pig Iron.—Some furnace agents report a good run of orders for the past week, but the total volume of trade was undoubtedly below the average of recent weeks. Negotiations are progressing for round lots of Iron by large buyers, but consumers generally are holding off until January. There are a few sellers, however, who are impelled by various circumstances to force business, and a lower range of values has, perhaps, temporarily been established. There is a disposition on the part of the leading members of the local trade to withdraw from the market for a short time to let the weak brethren fill their order-books at these prices, after which it would be hoped that a firm basis could be established for the business of the coming year. If this could be done it would probably have a very beneficial effect, as it seems to be wholly unnecessary, especially in the case of Lake Superior Charcoal Pig Iron, to make the concessions which have lately been reported. We revise our quotations as follows to meet the conditions referred to above, quoting on a cash basis, f. o. b. Chicago: Lake Superior Charcoal, Nos. 1, 2 and 3, \$21 @ \$21.50; Alabama Car-Wheel, \$27; Tennessee Car-Wheel, \$24.50; Southern Charcoal Foundry, \$22.50 @ \$23.50; Jackson County Softeners, No. 1, \$21 @ \$21.50; American Scotch, No. 1, \$21 @ \$21.50; Lake Superior Coke, All Ore, No. 1, \$20.50 @ \$21; No. 2, \$19.50 @ \$20; Cinder Mixed, 50¢ less; Coke Bessemer, run of furnace, \$20.75 @ \$21.25; Southern Coke No. 2, \$20 @ \$20.50; No. 2 1/2, \$19 @ \$19.50.

Bar Iron.—Orders for about 3000 cars have been placed since our last report, and other large orders are under negotiation, so that the prospects are bright for the Bar trade. Inquiries are coming in from other directions also, and January will probably

find business quite active in this line. At present trade is quiet, but prices are not quite so low as were reported last week—namely, 1.80¢ for carload lots of Common, f. o. b. Chicago, with a concession for large orders and favorable specifications, and 1.90¢ @ 1.95¢ for Good Muck Bar Iron. Store trade is less active than last week, with quotations still 2.10¢ @ 2.25¢, according to quantity and quality.

Structural Iron.—Orders are scarce, owing to the season. First-class Angles are quoted at 2.30¢ at mill, in carload lots; Ordinary Angles, 2.40¢, Chicago; Tees, 2.60¢ and Universal Plates, 2.40¢ @ 2.45¢, both at mill; Beams, 3.40¢ here in carload lots and 3.80¢ from store.

Plates.—A very fair business is reported for the past week, both in mill orders and store sales, the orders running largely to Steel. Mill prices are firmer, Tank, in carload lots, being quoted at 2.50¢, f. o. b. Chicago. Heavy Sheets are also a shade higher. Store prices are as follows: Heavy Sheets, Nos. 10 to 14, 2.80¢; Tank, 2.75¢; Iron or Steel Shell, 3.25¢; Flange, 4.25¢; Fire-Box, 4.75¢. Boiler Tubes are still quoted at 52 1/2¢ discount, but this price can be shaded for good round lots.

Sheet Iron.—Being between seasons for the mills, there is little doing in carload lots, except for specialties. No. 26 Common is reported to have been sold at 3¢, f. o. b. Chicago. Jobbers are doing a good business in small lots on a basis of 3.50¢ for No. 27, with concessions of 10¢ @ 20¢ per 100 lb, according to quantity.

Galvanized Iron.—Manufacturers are somewhat indifferent about taking orders for large lots at the rates now current, although an advance has been fully established. Jobbers' prices are 60¢ off for Juniata and 60 and 5¢ off for Charcoal.

Merchant Steel.—Manufacturers' agents report quite a good business in progress. A single order for nearly 50 tons of Tool Steel alone was entered last week. Store trade is also better than the average of recent weeks. It is worthy of note that a number of Car specifications have recently been placed calling for Soft Bessemer Steel instead of Iron. Store prices are as follows: Bessemer Bars, 2.35¢; Tool Steel, 8 1/2¢ @ 9 1/2¢; Specials, 13¢ @ 25¢; Crucible Spring, 4.25¢; Open-Hearth Spring, 3.30¢; Open-Hearth Machinery, 2.75¢ @ 3¢; Crucible Sheet Steel, 7¢ @ 11¢.

Steel Rails.—Inquiries are slightly increasing, but no sales are reported. The manufacturers are still quoting \$36.

Old Rails and Wheels.—Sales of Old Rails are reported at prices ranging from \$20.87 to \$21.50, in lots of 200 to 600 tons. In Old Car Wheels there is no movement whatever, nominal quotations being \$20.50 @ \$21.

Scrap Iron.—Consumers' stocks of Forge Scrap are running low, and a buying movement is expected to set in soon. For such small lots as they can purchase from railroad companies direct the consumers are paying better prices than the dealers offer. A considerable inquiry is still reported for Cast, of which very little is now to be had. We quote carefully selected Scrap as follows: per net ton of 2000 lb.: Railroad Shop, or No. 1 Forge, \$20 @ \$21; Railroad Track, \$19; Horseshoes, \$21; Mill Iron, or No. 1 Wrought, \$15.50 @ \$16; No. 2 Wrought, Tank, Flues, &c., \$13.50 @ \$14; Light Wrought, \$10; Machinery Cast, \$15.50 @ \$16; Stove Plate, \$11 @ \$11.50; Cast Borings, \$9.50; Wrought Turnings, \$12 @ \$12.50; Coil Steel, \$13; Leaf Steel, \$15; Locomotive Tires, \$18; Axles, \$26. For Mixed Country Scrap quotations are \$12.50 @ \$13.

Barb Wire.—A light demand is reported. There is a great deal of inquiry for future delivery, but neither manufacturers nor jobbers show much inclination to meet the wishes of buyers in this respect. What little is sold is for immediate delivery, and prices are in favor of the buyer. Jobbers quote 3.20¢ @ 3.25¢ for Painted, with the usual advance of 1/4¢ for Galvanized, but concessions are made, according to circumstances. While nothing was actually accomplished by the manufacturers at their meeting here last week, the result of their interchange of views has inspired them with hope that some plan for sustaining prices can be put in operation before long.

Nails.—Large orders for Cut Nails have been very scarce recently, but jobbers are selling quite freely to the small trade. Manufacturers' prices for carload lots are \$2 for Iron Nails and \$2.05 @ \$2.12 1/2 for Steel, f. o. b. Chicago. The Wheeling manufacturers maintain their price at the higher figure, but their competitors at other points are cutting rates down to the lower figure named. Jobbers quote \$2.10 @ \$2.15 for Iron and \$2.20 @ \$2.25 for Steel in small lots. Wire Nails are quiet after the heavy sales recently reported. Jobbers quote \$3, with the usual allowance for carloads.

General Hardware.—Business is slackening up its pace a little, especially in the demand for Shelf Hardware, Cutlery, &c. For heavy Hardware, Wagon stock, Carriage goods, &c., the volume of business continues to be well sustained, showing that manufacturers are still well employed. The unusually protracted activity in Hardware threatens to interfere with stock-taking, and some jobbers have called their traveling men

home to assist in this work, as well as to restrict sales for the time being. Prices generally are very firm. Indications for the spring trade are as encouraging as our leading merchants have ever seen, when there was not a "boom" in progress. Collections are still very good.

Pig Lead.—Sales of 600 tons Argentiniferous are reported at 4.95¢ @ 5¢, and 250 tons Common Missouri and Wisconsin at 4.80¢ @ 4.85¢, the bulk of which goes into consumers' hands. The market closes firm.

Copper.—Copper Sheets and Bars have again been marked up to correspond with the advance in Ingot, and are now quoted at 25¢, which is an advance of 7¢ in the past two months.

Cleveland.

CLEVELAND, December 19, 1887.

Iron Ore.—There are 240,000 tons of unsold Ore on the docks at the 10 Lake Erie ports. It is nearly all of a non-Bessemer grade, for which inquiries are somewhat limited. A few furnacemen in the interior have asked for the best Bessemer Ore obtainable during the past week, but sales were limited. Much interest is being manifested by both manufacturers and dealers as to the probable prices for Ore next season. In two or three weeks active negotiations will begin, and a formal schedule of rates will be agreed upon. Lake freights will, in all probability, be less exorbitant, although vesselmen claim that the reduction will be small. Unless carrying rates come down to reasonable figures it is quite safe to predict a restricted production in 1888. Ore-producers' profits were far too meager last season to warrant arrangements for a larger output, with the prospect of putting all margins in the pockets of the vesselmen. This is the situation as viewed by furnacemen and Ore dealers generally.

Pig Iron.—Although the market was unfavorably affected by the President's message, the result was less disastrous than in districts where the tariff sentiment is less pronounced. Furnacemen and iron dealers refuse to believe that Congress will carry out the recommendations in the message. They have succeeded in partially dispelling the fearful feeling noticeable among buyers last week. Considerable Iron had been sold during the week, 1500 tons of Strong Foundry selling at \$20.50, cash, at the furnace. Lake Superior Charcoal Iron is reported scarce. Quotations, f. o. b. cars Cleveland, are:

| | |
|---|---------------|
| Nos. 1 to 6 Lake Superior Charcoal..... | 22.50 @ 23.00 |
| No. 1 Strong Foundry, Bessemer quality, per ton..... | 20.50 @ 21.00 |
| No. 1 Strong Foundry, per ton..... | 20.50 @ 21.00 |
| No. 2 Strong Foundry, per ton..... | 19.00 @ 20.00 |
| No. 1 American Scotch, per ton..... | 20.35 @ 20.85 |
| No. 2 American Scotch, per ton..... | 19.35 @ 20.35 |
| No. 1 Soft Silvery, per ton..... | 20.90 @ 21.90 |
| Mahoning and Shenango Valley Neutral Mill Irons, per ton..... | 17.85 |
| Mahoning and Shenango Valley Red Short Mills, per ton..... | 18.35 |

Manufactured Iron.—Business has been quite active. There has been a steady demand for Bar Iron, 1.80¢ being the ruling quotation. Millmen have adhered to this figure with considerable firmness. Stocks are low and dealers say that after the annual inventories the demand will be heavy.

Old Rails and Wheels.—There have been but few transactions during the week. One firm sold 500 tons of Old American Rails at \$23, but it is said that not over \$22.50 could now be obtained. Old Wheels are inquired for at \$20 @ \$20.50, but sellers ask \$21, and will not sell until this price is obtained.

Sheet Iron.—Jobbers are still enjoying a good trade. Stocks are limited, but the demand is fairly well supplied. No 27 is quoted at 3.50¢, but concessions of 10¢ @ 20¢ per 100 lb. are made to large purchasers.

Chattanooga.

Office of The Iron Age, Carter and Ninth Sts.,
CHATTANOOGA, TENN., December 19, 1887.

With the exception of the natural closing up of business accounts at the end of the year, business of all kinds keeps up remarkably well. It was expected by many that the numerous new enterprises that have been inaugurated during the year would slow down to some extent, but so far as can be observed they all appear to be moving along with apparent strength. A matter of much more than commercial interest develops itself more and more every day in the matter of Southern transportation. Never before in the history of Southern railroads has their capacity been so inadequate to meet the requirements of the country as at present. The single-track lines are blocked for want of track capacity, motive power and rolling stock, and it is very evident that more through lines are needed, as well as largely increased carrying capacity. In money matters it may be said that while money is very close, nearly all of the legitimate business of the country appears now to be taken care of.

Pig Iron.—The future of the market is a rather difficult problem to solve. With all the lights that now present themselves, this article is certainly in a very healthy condition, and there has been no falling off in the demand. Prices have been maintained, and sales are being made by producers at satisfactory figures. The furnace plants that have been inaugurated are all being pushed forward to early completion. We note sales of round lots of Pig at the furnace banks on a basis of \$18 and \$17 for Nos. 1 and 2, 60 days.

Metallic Key, Leather Lined.....dis 55&10 ● 60&10
 Cork Lined.....dis 70 ● 76&10

| | |
|--------------------------------------|-----------|
| Burnside's Red Cedar..... | dis 50 |
| Burnside's Red Cedar, bbl. lots..... | dis 50&10 |

Files.
Domestic—
Best brands

| | | | |
|---|------------------|---------|---------------|
| Groceries..... | | | |
| Good..... | dls 68 | 10 & 5 | @ 68 & 10 & 5 |
| Hair brands..... | dls 70 | & 70 | & 10 & 10 |
| Seller's Horse Rasps..... | dls 68 | 7 & 5 | & 10 & 5 |
| Imports..... | | | |
| J. & Riley Carr..... | List, Apr. 1, | 1883, | ds 15 |
| J. & Riley Carr Horse Rasps..... | List, Apr. 1, | 1883, | ds 20 |
| Mossmanble..... | Dutchess's list, | ds 20 | |
| Butcher..... | Dutchess's list, | ds 20 | |
| Tent..... | Wholesale list, | ds 20 | & 25 |
| Graves' Horse Rasps..... | American list, | ds 60 | |
| Fitting Machines. | | | |
| No. 1, 2-inch Roll..... | \$3.25 each | { ds 35 | |
| Knox, 3-inch Roll..... | \$3.60 each | { ds 35 | |
| Eagle, 3-inch Roll..... | \$2.15, ds 25 | { ds 35 | |
| Crown, 4-in. \$5.50; 6-in., \$4.00; 8-in., \$6.50 | | { ds 35 | |

Crown Jewel..... 6 in. \$2.99 each, 12 in. \$5.00
 Domestic Plater..... \$3.49 to \$1.50 each, net
 Geneva Hand Plater, White Metal..... \$2.12, 12 in. \$3.99
 American Plater..... \$3.49 to \$1.50 each, net
 Shepard Hand Plater, No. 85..... \$2.00, 12 in. \$3.49
 Shepard Hand Plater, No. 110..... \$2.00, 12 in. \$3.49
 American Plater..... \$3.49 to \$1.50 each, net
 Clark's Hand Plater..... \$2.00, 12 in. \$3.49
 Combined Plater and Sled Iron..... \$2.00, 12 in. \$3.49
 Domestic Plater..... \$3.49 to \$1.50 each, net
Fluting Scissors..... dis 45
Forks—Ray, Maunroe, & Assn. list..... dis 65 55
 Ray, Maunroe, & Co., Phila. list..... dis 60 & 60 55
 Pated, see Spoons
Fruit and Jelly Presses..... dis 20 to 10 30
Frying Pans..... dis 20 to 10 30

| | | |
|---|-------------|------------|
| Fls. | ..... | dis \$4.50 |
| Fr. Pans. | | |
| Association List..... | dis 75 @ 75 | 10 11 25 |
| 100..... | dis 75 @ 75 | 10 11 25 |
| 100..... | dis 75 @ 75 | 10 11 25 |
| 100..... | dis 75 @ 75 | 10 11 25 |
| Fuse. | | |
| Common Hemp Fuse, for dry ground..... | ..... | \$1000 ft. |
| Common Cotton Fuse, for dry ground..... | ..... | 2.85 |
| Single Taped Fuse, for wet ground..... | ..... | 4.75 |
| Double Taped Fuse, for very wet ground..... | ..... | 7.25 |
| Triple Taped Fuse, for very wet ground..... | ..... | 7.25 |
| Small Gutta Percha Fuse, for water..... | ..... | 12.50 |
| Large Gutta Percha Fuse, for water..... | ..... | 12.50 |
| Gauges. | | |
| Marking Mortise, &c..... | dis 60 | 10 11 25 |
| Wire, low line..... | dis 10 | 10 11 25 |

| | |
|--------------------------------|----------------|
| Wire, Moore's..... | dis 50 @ 50¢25 |
| Wire, Brown & Sharpe's..... | dis 50 @ 50¢25 |
| Gimlets..... | dis 50 @ 50¢25 |
| "Diamond" Gimlets..... | dis 50 @ 50¢25 |
| "Diamond" Gimlets..... | dis 50 @ 50¢25 |
| Double Cut, Shephardson's..... | dis 50 @ 50¢25 |
| Double Cut, Shephardson's..... | dis 50 @ 50¢25 |
| Double Cut, Douglas's..... | dis 50 @ 50¢25 |
| "Bee"..... | dis 50 @ 50¢25 |

Glue Pots

| | |
|-----------------------------------|--------------------|
| Tinned and Enamelled..... | dis 40¢25 @ 40¢105 |
| Family, Lowe's "Eureka"..... | dis 40 |
| Family, L. F. & C.'s "Handy"..... | dis 50 |

Grindstone Fixtures.

| | |
|-----------------------|------------|
| Barrett's Patent..... | dis 70¢105 |
| Barrett's Patent..... | dis 70¢105 |
| Barrett's Patent..... | dis 70¢105 |

Hack Saws.—See Saws.

Halters.—Cover's Pat. 4 Jute dia 50x2 2
Cover's Hemp Horse and Cattle Ties dia 50x2 2
Cover's Jute Horse and Cattle Ties dia 60x10 1 1/2

Hammers.

Handled Hammers. List Dec. 1, 1885, dia 50 c 35x1 1/2

Ward's
Cheney's
Hartford Hammer Co.'s List Jan. 15, '87,
Bain's dia 50 and 50 1/2
C. Hammond & Son 10 c
Hammann & Beckley
Atlas Tool Co.
Verree dia 5 c
Magnetic Tack, Nos. 1, 2, 3, 4, 5, 1.25, 1.50 & 1.75, dia 50x10 1/2

Warner & Nobles.....dis 30 @ 25 ¢
Peck, Stow & Wilcox.....dis 40 ¢
.....dis 33 1/2 @ 10 ¢
Heavy Hammers and Sledge-
3 lb and under..... 40 ¢
..... 30 ¢
Over 3 lb..... 20 ¢
Wilkinson's Smiths'.....10 1/2 @ 11 ¢
Providence Tool Co., Hand Cuts, \$15.00 w dos.....dis 10 ¢
Providence Tool Co., Leg Irons, \$25.00 w dos.....dis 10 ¢
Daley's Improved Hand Cuts: 2 Hands, Polished.....dis 25 ¢
w dos. 18¢. Nickelled, \$67; 2 Hands, Polished, w dos. 18¢. Nickelled, \$67.....dis 20 ¢
Handles.....
Iron, Wrought or Cast.....

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|---|--------|-----|-----|-----|-----|------------------------------|
| No. | | 1 | 2 | 3 | 4 | |
| Per doz. | \$9.00 | L18 | L35 | L50 | L65 | * dis \$0K10A10 * |
| Jorgin's..... | | | | | | * dis \$0K10A10 * |
| Drop Ladders..... | | | | | | * dis \$0K70P * * |
| Jap'd Store Door Handles-Snits, \$1.80; Plate, \$1.10- No. 20, \$0.55..... | | | | | | * dis \$0K10A10 * |
| Store Door..... | | | | | | * dis \$0K10A10 * |
| Chest and Lifting..... | | | | | | dis \$0K70 * |
| Handles, Wood- Lax and Pine..... | | | | | | * dis \$0K10 * @ \$0K10A10 * |
| Hammer Hatchet, Axe, Sledge, etc..... | | | | | | * dis \$0K25 * |
| Bradawl..... | | | | | | * gross \$0.00 |
| Screwdriver..... | | | | | | * gross \$0.00 |
| Hickory Firmer Chisel, large..... | | | | | | * gross 5.0C * |
| Apple Firmer..... | | | | | | * gross 5.00 * |
| Chisel, large..... | | | | | | * gross 5.00 * |
| Firmer..... | | | | | | * gross 5.00 * |
| Socket Firmer Chisel, assorted..... | | | | | | * gross 5.00 * |

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| Great Seal | | dis \$2.00 |
| Gravel | Wood Track | dis \$2.00 |
| H&S | | dis \$2.00 |
| H&S | Wood Track | dis \$6.00 |
| Hamilton | | dis \$6.00 |
| Harley | Wester, Modina Mfg. Co.'s list. | dis \$6.00 |
| Ilmax Anti-Friction | | dis \$5.00 |
| Ilmax Steel | Anti-Friction | dis \$4.00 |
| Ilmax Steel | Wood Track | dis \$4.00 |
| Ilmax Steel | Wood Track | dis \$4.00 |
| Lead's Steel Arm | | dis \$4.00 |
| Challenger | Barn Door | dis \$4.00 |
| Challenger | Improved "Anti-Friction" | dis \$6.00 |
| No. 1, I.B.; No. 5, I.B.50 | No. 8, I.B. | dis \$4.00 |
| Idler | | dis \$4.00 |
| Idler's | | dis \$6.00 |
| "the Boom" | | dis \$4.00 |
| Ilmax Steel | | dis \$4.00 |
| Ilmax (Wood Track) | | dis \$6.00 |
| Supply Patent | \$ do. pr. 8¢ in. \$10: 5 m. | |

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Kelco, Inc. from dis 50 6
Kell, Malvern dis 40 5
Kerns.—See Snaps.
Hatchets.—List Jan. 1, 1896..... dis 30 6 405
Jahab Blood..... dis 40 5
John Shingling Lee dis 40 2 5
Johnson, R. S. dis 40 10 5
Lufano Hammer Co dis 40 6
Lurd's dis 40 5
Lynch & Plumb dis 40 10 5
M. Mann, Jr., & Co dis 50 6 50 2 5
Marshall, J. H. dis 40 5 50 2 5
Herhill's Haines and Bright goods..... dis 35 4
Hammond & Son..... dis 40 10 50 5
Mann..... dis 40 10 50 50 10 2 5
Melby dis 50 6 50 2 5
Melly's dis 40 10 50 50 10 2 5

| | | |
|-----------------------|------------|-----------|
| Flyk Eddge Tool Co. | dis 408100 | dis 102 5 |
| olins, following list | dis 108 5 | dis 10 5 |
| Claw, Nos. 123 | dis 6 00 | dis 7 00 |
| Lathing Nos. 123 | dis 5 50 | dis 6 50 |
| Hay Kives. | | |
| Machine | dis 118 50 | dis 25 5 |
| Electric | dis 17 | dis 30 5 |
| Pen | dis 118 5 | dis 10 5 |
| Needle | dis 40 10 | dis 10 5 |
| Needle | dis 11 50 | dis 17 0 |
| Needle | dis 11 50 | dis 14 00 |
| Hinges | | |
| rought from Bangs- | | |
| Shop and T. | dis 70 45 | dis 70 10 |

| | | |
|---|-------------------------|--|
| Diets, Larch and stinges..... | \$40 sets \$12, \$10 50 | |
| Parker..... | dis 75 50 | |
| Palmer..... | dis 50 50 | |
| Harmon..... | dis 50 50 | |
| Nicholson..... | dis 50 50 | |
| Huffer..... | dis 50 | |
| Clark's Mortise Gravity..... | dis 50 | |
| Sargent's, Nos. 1, 8, 6, 11, 1K..... | dis 75 100 75 10 85 | |
| Green..... | dis 50 50 | |
| Reading Gravity..... | dis 75 10 75 10 85 | |
| Shepard's "Rolsens" Nos. 50, 60, 65 55 75 10 45 | | |
| Shepard's Niagara Gravity..... | dis 75 10 85 | |
| Shepard's Buffalo Gravity Nos. 1, 3 and 5..... | dis 75 10 85 | |
| Shepard's Champion Gravity No. 7..... | dis 75 10 85 | |

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| Lane's Crescent Scovill Pattern..... | \$18.95 |
| Lane's Improved Scovill Pattern..... | \$17.00 |
| Maynard, S. & O. Pat..... | \$16.95 |
| Sandusky Tool Co..... | \$16.00 |
| Hubbard & Co..... | \$16.00 |
| Bare "..... | \$16.00 |
| Cirrus "..... | \$16.00 |
| Hoe Ringers and Nippers..... | |
| Life Improved Ringers..... | # doz. \$35.00 \$ 5.75 |
| " Life Old Style..... | # doz. \$3.00 \$.50 |
| Life Tongue..... | # doz. \$35.00 \$ 6.00 |
| Life's Rings..... | # doz boxes, \$2.00 # 2.50 |
| Best Ringers..... | # doz box, \$2.00 # 2.50 |
| Perfect Ringers..... | # doz box, \$2.00 # 2.50 |
| Fair's Hoe Ringers..... | # doz, \$2.00 |
| Life's Hoe Ringers..... | # doz, \$2.00 |
| Champion Ringers..... | # doz, \$2.00 |

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|-----------------------------------|-------|-------|-------|-------|
| ...times Hollow-Ware..... | | | | |
| Salvaged Tea-Chest..... | | | | |
| Inch..... | | | | |
| Each..... | | | | |
| Need & Barton..... | | | | |
| Imperial Britania Co..... | | | | |
| Robinson & Hillier & Co..... | ..... | ..... | ..... | ..... |
| Loggers & Brother..... | ..... | ..... | ..... | ..... |
| Harford Silver Plac Co..... | ..... | ..... | ..... | ..... |
| William Rogers Mfg Co..... | ..... | ..... | ..... | ..... |
| Books. | ..... | ..... | ..... | ..... |
| ... Case, Sargent's list..... | ..... | ..... | ..... | ..... |
| ... Case, Reading..... | | | | |
| ... Jones..... | | | | |
| ... Jones Line. Reading list..... | | | | |
| ... Sargent's list..... | | | | |
| ... Sargent's list..... | | | | |

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|---------------------------------|-----------------------------|
| Men's Applique Handies..... | 9 dos \$6.00, dis 40 s |
| Men's Rosewood or Cocobolo..... | 9 dos \$9.00, dis 40 s |
| Knives..... | |
| Butcher Knives..... | dis 150 s 20 s |
| Butcher Knives..... | dis 25 s |
| Butcher Knives..... | dis 25 s |
| Shoe Knives..... | dis 200 s 25 s |
| Bread Knives..... | 9 dos \$1.50, dis 15 s 30 s |
| Shoe and Hair Knives..... | dis 15 s 30 s |
| and Straw..... | See Hay Knife |
| and Pocket..... | See Cutlery |
| Tools..... | |
| Mineral..... | 65s 74 s |
| For Jap'd..... | 75s 84 s |
| For Forks..... | 75s 84 s |
| For Plated Nickel..... | \$2.00 or 2.25 |
| For Porcelain..... | dis 35s 104 s 10 s 104 s |

| | |
|--|----------------------------|
| ature Plain Wood Knobs, list Dec. 1835 | dis 49 |
| ature Flaws | dis 756 gross incl. dis 10 |
| ature Wood Rubber Ties | dis 702102 incl. dis 70 |
| ars, Judd's | dis 608102 incl. dis 70 |
| ars, Sargent's | dis 608102 incl. dis 70 |
| ars, Hemlock | dis 3585 |
| ter, Pouchett's | dis 60410 |
| rs, Japanese | dis 60810 |
| dis | dis 60810 |
| ailing, Sargent's | dis 52420 |
| ing, Sargent's | dis 52420 |
| ing, Monroe's Patent | dis 52420 |
| ing, P. & W. | dis 52420 |
| ing, Warner's | dis 52420 |



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Electro-Plating and Electrotyping Machines
IN ALL SIZES,
FROM \$60 UPWARDS.



**CHEAPEST
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AND
POLISHING
MATERIALS**

ZUCKER & LEVETT CHEMICAL CO.,
ESTABLISHED 1863, INCORPORATED 1881,
SOLE MANUFACTURERS AND PATENTEES.

WORKS: 538 to 564 W. Sixteenth St OFFICE: 36 to 40 Eleventh Ave. New York, U. S. A.

Trade Report.

General Hardware.

The market continues with an exceptionally good demand for the time of year, and there are indications on all sides of a satisfied and confident feeling. Prices, except as affected by the increased cost of metals, are substantially unchanged, but several sharp advances have been made in lines thus affected, with a probability of others in the near future.

BARB WIRE.

The New York market is firmer, manufacturers having advanced prices to 3.85¢ to 3.90¢ for carload lots of Galvanized Barb Wire.

The manufacturers of Barb Wire held a meeting at the Tremont House, Chicago, on the 14th and 15th insts., the only important producing center unrepresented being St. Louis. The call for the meeting emanated from the Joliet manufacturers, not from the United Wire Company, and the object sought to be accomplished was an advance in prices. R. E. Sears, of Marshalltown, Iowa, presided over the deliberations of the manufacturers. There was a decided unanimity of opinion that at present prices the business is unremunerative and that a remedy is badly needed, but it was found impracticable to agree upon a course of procedure in the absence of some of the largest manufacturers. So far as immediate results are concerned, the meeting was therefore fruitless, but the promoters are not without hope that something can yet be done to bring the manufacturers to agree upon a plan that will benefit the trade. If this cannot be done, and done soon, it is felt that the business will become hopelessly demoralized. In the meantime manufacturers are cautious about making contracts for Barb Wire for future delivery at present prices, trusting that some understanding can be effected which will make the spring trade reasonably profitable.

NAILS.

The situation in Nails in New York during the last week has not materially changed, the slightly better feeling continuing. The volume of trade is quite fair, and prices, though a little steadier, are still unsatisfactory, on the basis of \$2 for Iron Nails from store. It is probable that at an early date a number of mills will close down.

WIRE NAILS.

The recent heavy purchases by some of the largest jobbing houses in the country is regarded as significant of their view that the purchase of Wire Nails at present prices is a safe investment. It is noted that there is no evidence of a strengthening of the market, as a figure two or three weeks regarded as extremely low, and in fact quite exceptional, is now more freely made, and obtained without much trouble by good buyers in large lots.

AMMUNITION.

The prices of Ammunition were advanced on the 16th inst. by the associated manufacturers, on account of the large advance in Copper and other metals. The changes made are indicated in the following table which gives both the old and the new prices:

Rim Fire Cartridges, advanced from 60¢ to 50¢ 5/8.
Rim Fire Military Cartridges, no change.
Center Fire Cartridges, Pistol and Rifle, advanced from 45¢ to 35¢ 5/8.
Center Fire Cartridges, Military and Sporting, advanced from 30¢ to 25¢ 5/8.
Blank Cartridges, 22 caliber, advanced from \$1.50 to \$1.75 per 1000.
Blank Cartridges, 32 caliber, advanced from \$3.00 to \$3.50 per 1000.
All other Blank Cartridges 10% less than Ball Cartridges.
Primed Shells and Bullets, advanced from 25¢ to 15¢ 5/8.
B. B. Cap round ball, advanced from \$1.00 to \$1.75 per 1000.
B. B. Caps swaged conical ball, advanced from \$1.75 to \$2 per 1000.
Borden Primers and B. L. Caps, advanced from 90 cents to \$1 per 1000.
U. M. C. Primers, advanced from \$1.10 to \$1.20 per 1000.

No change was made in the prices of Brass and Paper Shot Shells and Gun Wads. It is understood that this advance was made without any previous intimation to the trade, and that consequently comparatively few orders were booked at the old prices. It is also understood that the manufacturers are constraining this advance strictly, and refusing to accept orders at the old price which were not at that time in hand.

FILES.

The File market is in such a condition that the manufacturers are giving attention to the question as to whether any steps can be taken which will result in securing relief from what they refer to as unprofitably low prices. The present price of Steel, as compared with the price a year ago, is alluded to as necessitating such advance, but the difficulty is in the large number of manufacturers and the irregularity of ruling prices. Measures are in contemplation which, if carried into effect, would no doubt relieve the situation, such measures looking to a limiting of the production, which is conceded to be in excess of the demand. There is at present but little reason for thinking that all the manufacturers can be induced to unite in the proposed measures, and it remains a question whether, with those that are likely to remain outside, a great deal can be accomplished. The following view of the situation from an intelligent observer refers to:

the proposed measures rather from the manufacturers' standpoint, and indicates the measures under consideration, and the results that would follow if the plans were successfully carried out.

The File manufacturers are casting about for means of relief from the unremunerative condition of their business. The Steel which they use has advanced nearly 50 per cent. in cost in the past year, without any advance whatever in the price of Files. Even at the old price of Steel they claim that there was no profit in manufacturing Files, owing to the low rates at which they were sold, the capacity for production being greatly in excess of the needs of the market. There are only a few File manufacturers, it is true, but there are about 160 small makers, whose expenses are light and who supply consumers in sufficient quantity to interfere with the business of those who make complete lines of goods. Notwithstanding the increased cost of Steel the price of Files has been kept down to the old rates, because the manufacturers had laid in large stocks of their raw material, and expected that by the time it was worked up the price of Steel would be back to nearly the old figure. But Steel obstinately refuses to go back, and now that the File manufacturers are replacing their stock with a much dearer article they find an advance absolutely necessary. The large manufacturers believe that the best way to accomplish this is through the restriction of production, and it is probable that an arrangement will be made on the basis of 60 per cent. of the average sales of each concern for the past three years, enforced by a money forfeit deposited in a common fund by each manufacturer. The restriction of production would advance prices itself without a uniform rate being agreed upon by all the trade. It is stated that stocks of Files are now very low in jobbers' and retailers' hands throughout the country, so that an advanced price by the manufacturers would become operative immediately in the entire trade.

While it remains an open question how much will be accomplished in the direction indicated, there is little doubt that the ruling high prices of Steel—which, however, comparatively few of the manufacturers are yet paying, as most of them purchased stocks previous to the last advance—will, if continued, require an advance beyond the extreme figures which have been made for some time by some of the manufacturers. In the present state of the market there is still the irregularity of price which has characterized this line for some time, some of the manufacturers selling Files at discounts far below those which are made by others, with, however, a tendency toward slightly higher figures.

MISCELLANEOUS PRICES.

The Sanford Fork and Tool Company, Terra Haute, Ind., have just issued a new price list for the Old Colony Shovels, Spades, Scoops and Drainage Tools, of which they are now manufacturers. It is a clearly printed pamphlet of 52 pages, the illustrations of the different styles of Shovels, Scoops, Spades, &c., occupying eight of these pages. The list, we observe, is the same as the Ames. It is subject to a discount of 20 per cent., there being an extra discount of 10 per cent. to all parties whose net purchases exceed \$500 in six months. In addition to these discounts the company will allow at the close of the season, January 1, 1889, a further discount of 2 1/2 per cent. to all parties whose net purchases exceed \$1000 during said term, and 5 per cent. to all parties whose net purchases exceed \$1500 for the same time. These extra discounts will not be deducted before the expiration of the six months, and it is stated that it will be forfeited by all parties who have sold their goods at a greater discount than 20 per cent.

In announcing the advance on Padlocks the Nimick & Brittan Mfg. Company, Pittsburgh, Pa., state that, owing to the advance in Copper and other metals used in the manufacture of Brass and Bronze goods, they are compelled to advance 10 per cent. the present net price on all goods manufactured in part or entire of these metals. All former net prices are accordingly withdrawn.

Owing to an advance in the price of Copper, Thomas Norton, 65 Elizabeth street, New York, withdraws all quotations on Sash Chains and Attachments.

At the meeting held in Buffalo last week by the manufacturers of Common Carriage Bolts a change was made in the regular price of the goods, such change to go into effect January 1. By this action the regular discount was fixed at 70 and 15 per cent., the extreme rebate being made 5 per cent., with the same terms as now regarding delivery and cash discount. It is understood that this action was taken because of the judgment of the manufacturers that the margin allowed to wholesale buyers was unnecessarily large, the fact that it was in many cases in part given away to their customers being referred to. When the existing scale of rebates was determined, it is stated, that some of the manufacturers were in favor of having the extreme rebate 5 or 7 1/2 per cent., and the action taken is regarded as indicating that the manufacturers generally have been convinced of the substantial wisdom of this view. The market for Carriage Bolts is decidedly firm, and the trade will notice that the change made to go into effect January 1 is not a reduction in the price of the goods, the extreme price being substantially the same as it has been, but that the discount to the small trade simply is increased.

The Rope market continues weak and without quotable change in price.

Since our last report Copper Rivets and Burrs have been sharply advanced, and are held now, by several at least, of the leading manufacturers, at discount 50 per cent.

The manufacturers of Coffee Mills have been in conference in regard to measures that may be adopted to regulate the market, and it is thought not unlikely that a satisfactory understanding may be reached.

Strap and T-Hinges continue without material change, but it is understood that some conferences have taken place with a view to determining whether or not it is feasible to renew an understanding among the manufacturers, on a different basis, however, from that which recently existed.

The manufacturers of Hammers have also been consulting, but at the recent meeting, to which reference was made in our last issue, nothing definite was accomplished. The matter is still, however, under advisement.

Brass and Bronze goods, and those into which Copper and the other metals which have recently advanced in so marked a degree enter, are very much strengthened and in many cases advanced. Many of the manufacturers are considering the advisability of announcing advances, and in the meantime are exercising caution in regard to the booking of orders and are withdrawing outstanding quotations. In several lines higher prices are to-day named by the manufacturers than those at which the goods can be purchased from second hands, the holders of the goods in many cases failing to follow the manufacturers closely in the advance of prices. Almost every day brings the announcement of an increased price demanded by some of the manufacturers, such advances in several cases being 20 to 25 per cent., and it is expected that by the opening of the new year, or immediately after it, there will be the announcement of many more such advances by leading manufacturers of miscellaneous lines of Brass goods.

The Dripping Pan manufacturers held their annual meeting at the Grand Pacific Hotel, Chicago, on the 14th inst. and adopted a slightly higher scale of prices on the small sizes, so that the sizes ranging from 6 x 9 to 8 x 12, inclusive, are now held at prices a quarter of a cent per pound higher than the larger sizes.

TRADE TOPICS.

In reply to the inquiry which we laid before our readers in a recent issue in regard to the prices at which goods should be inventoried when the interest account bears the expense of the discount for prompt cash, we have the following communication from a well-known manufacturer of Indiana:

Replying to your correspondent who asks whether he should enter in his inventory goods less the cash discount, we would say most certainly he should so enter them. He is desirous of finding out what he is worth on a cash basis—what his assets would bring to-day at fair sale. Now the goods in the supposed case are worth \$98, cash—they can be replaced for that—and they should be set down at that figure. The interest he pays on the money borrowed to save the discount is to be charged in to the cost of running his business, the same as his rent, insurance, clerk hire, &c., for if he sells the goods at once the interest is small; if he carries them longer this expense increases, just as do his rent and other expenses.

We have an inquiry from a well-known Hardware house of the West as to whether there is "any better method of filing invoices than the cumbersome Invoice Book that will not stay shut when two-thirds full." We take pleasure in leaving the inquiry with the trade, from whom we shall be pleased to hear in reply to it.

ITEMS.

A license of incorporation has been secured from the State of Illinois for Horton, Gilmore, McWilliams & Co., of Chicago, to manufacture and sell Hardware, with a capital of \$300,000. It is understood that this corporation will succeed the firm of William Blair & Co., jobbers of Hardware, at 172, 174 and 176 Lake street. The change will be made on January 1.

The catalogue and price list of the Climax Currycomb Co., 305 and 307 East Sixty-first street, New York, has been issued for the coming year. It illustrates the assortment of Curry Combs which they are putting on the market, special attention being called to their Steel Combs, and to the Champion Self-Cleaning. The company also alludes to their recently increased facilities for the manufacture of the goods as placing them in a position to promptly supply the demand.

John S. Brewer has removed his railway supply agency to 147 and 149 Van Buren street, Chicago, in the Rialto Building. For 13 years Mr. Brewer occupied offices in the Marine Bank Building, on the corner of Lake and La Salle streets, but has found it desirable to move to his new location on account of the concentration of railroad interests in that vicinity. He is agent for the Forist Steel Company, Tudor Iron Works, Helmbacker Forge and Rolling Mills Company, Standard Steel Works, Allison Mfg. Company, H. A. Rogers, Western Forge and Tool Works, and Nathan Mfg. Company.

The Francis T. Witte Hardware Company, 106 Chambers street, New York, are sending out a circular calling attention to the Mack Inaw Refrigerators and Ice Chests, Blanchard Ash-Sifter, Ajax Galvanized Iron and Wrought Steel Ash-Cans, Wire Mats, and the Table Knife Polishing Machine.

Chas. F. Weber, East Saginaw, Mich., is the inventor of an ingenious and efficient Truck, for the manufacture of which he is negotiating. It is intended especially for moving Stoves, and the point is made that there is no contrivance in the market with which one person can handle a Stove, and that this Truck is so arranged that this can be accomplished with facility. The Truck has four uprights with cross-bars at the bottom, these cross-bars passing under the Stove and being raised or lowered as may be desired by what appears to be a simple and efficient method. The points made in regard to this Truck are that one person can raise, move and again lower any Stove; that it makes no difference whether the Stove is hot or cold; that the Stove need not be taken apart; that there is no danger of breakage, and that it is practically indestructible. While being adapted to other uses it is intended especially for household use, and it is referred to as doing away with the annoyance and delay that are often connected with the removal of Stoves.

The Eclipse Mfg. Company have removed their office and salesroom from 125 and 127 South Clinton street to 88 Lake street, Chicago, where they will carry a stock of steam and hot-water warming and ventilating apparatus. They have just completed their new works at West 22d street and Western avenue, and are now prepared to fill orders promptly.

Oscar Barnett has purchased the machinery, tools and patterns of H. Sauerbier's Son, Newark, N. J., manufacturer of Saddlers', Harness-Makers', Trunk Trimmers', Shoemakers', Tanners' and Curriers' tools, and will continue the business in connection with his Malleable and Gray Iron foundries and machine works. The exceptional facilities thus afforded him for promptly furnishing goods of the best quality and finish are alluded to.

The trade will learn with regret of the death on the 13th inst. of Thomas McAvity, senior member of the firm of T. McAvity & Sons, St. John, N. B.

We have seen photographs representing the condition of the factory of the Tucker & Dorsey Mfg. Company, Indianapolis, Ind., immediately after the fire. The photographs indicate not only the completeness of the destruction, but also the extent of the works.

Among the Special Notices on page 19 one will be observed signed John Adams, in which a wholesale Hardware house advertises for an experienced Hardwareman, quick at figures and able to give exact cost on goods. It will be seen also that a somewhat unusual test is mentioned for those applying for the position.

The Phil. S. Wiseman Hardware Company, of Springfield, Ohio, has recently been organized with a capital stock of \$25,000. The incorporators are Phil. S. Wiseman, Ross Mitchell, William H. Hanford, Geo. H. Wilson and Geo. W. Hengst. The firm will do a jobbing and retail business in Hardware, Implements, Seeds, &c., and it is intimated that they will be in a position to compete with the jobbing trade East and West, both in prices and quality of goods. Phil. S. Wiseman, who will have charge of the business, is referred to as having exceptional qualifications for the position.

The Ammunition Manufacturers' Association, of which Mr. Hartley is president, on the 14th inst. appointed Gen. Augustus Gaylord commissioner, in the place of the late Charles Taylor. General Gaylord is recognized as having special qualifications for this responsible position, and has entered upon his duties with the best wishes of the trade for his success. William M. Odell has been appointed assistant commissioner.

Nettleton & Davis have established a manufacturers' agency at 115 Dearborn street, Chicago, representing A. W. Bishop, Horse Pokes; John Campbell, Trucks; Chaitanoga Tool Company, Hoes, &c.; Cummings & Hosack, Farm Bells; Draper & Son, Chalk and Fish Lines; Empire Knife Company, Shears and Scissors; Gallatin Mfg. Company, Hickory Spokes; Hartford Hammer Company, Hammers, &c.; Huron Block and Novelty Company, Blocks, &c.; Gibbs Lawn Mower Company; Moore & Barnes Mfg. Company; Tools, &c.; Oliver Bros. & Phillips, Wagon Hardware; Painesville Metal Binding Company; Sherman & Fearing, Boston Knobs; Union Soap Stone Company, Warners and Griddles; J. F. Wilkinson, Window Cleaners; H. Phillips, Gas Fittings, &c.; E. L. Walker, Hay Carriers and Forks. Mr. Nettleton, the senior partner of this firm, was the buyer for the Wells & Nelegar Company, of Chicago, for three years.

The many friends of J. G. Coleman, president of the Coleman Hardware Company, Chicago, will regret to learn of the death of his wife. This sad affliction occurred on the 7th instant after a very brief illness, of which a fatal termination was most unexpected.

Through the destruction of a large business block by an incendiary fire at Northwood, Iowa, on the 17th inst., J. M. Henderson, a Hardware merchant, loses \$6000, partly covered by insurance.

We have received from James B. Scott & Co., 122 and 124 Second avenue, Pittsburgh, Pa., a copy of their catalogue of Tin Plates, Metals, Japanned, Stamped and Pieced Tinware, Tinsmiths' Tools and Machines and Tinners' Supplies, recently issued. It is a volume of nearly 200 pages in an attractive

cover, well displayed in point of type and illustrations, and very generously arranged, so far as margins and white paper are concerned.

The Chadwick Lead Works, 176-186 High street, Boston, Mass., have favored us with a copy of their 1887 catalogue of lead pipe, sheet lead, &c. The publication is in pamphlet form, some 9 by 10 inches in size, containing over 40 pages. It is very fully illustrated with diagrams showing the thicknesses and sizes of lead pipe which they manufacture, and contains besides a great deal of information on related topics. Among other things there are rules and tables relating to water, water conduits and services, which will be found of great practical value. There is also presented a tabulated list of such New England water works as could be obtained, giving full details of head pressure, mains, service pipes, &c., very convenient for reference and comparison. In addition to what we have particularly referred to, there are many other tables and much miscellaneous information that will make the catalogue of decided value to all who are interested in the subject it treats of. Not the least merit of this publication is the excellent manner in which it is gotten up; the paper being highly calendered and the typography all that could be desired.

The Steel Works of Heller Bros., Newark, N. J., which were recently partly destroyed by fire, are now being rebuilt with the expectation that they will be ready for resumption of operations on January 2. Meanwhile, there is no interruption of their business, as they procure their Steel from the Newark Steel Works until they can make it themselves again.

In connection with his line of Novelty Glass Cutters S. G. Monce, Bristol, Conn., is offering Circle Sweeps for cutting circles, rounding ends of lights, &c. The success which is attending the sale and use of the Novelty Glass Cutters is also alluded to, and we are advised that they are used by a prominent glass house in this city on expensive sheets of polished plate glass in preference to the plate-glass diamond, their cutter having entire confidence in them and getting better results, especially on bent glass, or glass inclined to be somewhat refractory.

Mershon & Bancroft, 218 Lake street, Chicago, manufacturers' agents of Wire Goods, applied for the appointment of a receiver on the 16th inst. to take charge of the affairs of the firm. Their failure was precipitated by one of their creditors, who pressed for a more rapid payment of his claim, which the firm state they were reducing at a rate that should have been satisfactory. Being threatened with an enforced collection, they took the step above referred to for the purpose of protecting their other creditors. The Grant Wire & Spring Company, of Lockport, Ill., are involved in the failure, and a transfer of ownership may result from it. The low price of Wire is not responsible for this failure, nor are the commercial transactions of the firm, as their books, it is claimed, will show a profit on the year's business; but they engaged in some outside ventures which will probably be profitable ultimately, but which required more capital and took more time to develop than they had anticipated. A meeting of creditors will be held to-day (Wednesday), at which a full statement of the assets and liabilities of the firm will be made, and possibly an arrangement adopted under which the firm can continue in business.

The Cleveland Block Company, Cleveland, Ohio, advise us that they have added Self-Lubricating Sheave Bushings to all their heavy purchase Wire Rope and Snatch Blocks without advance of the price. This advantage thus possessed by the Blocks, in connection with previous claim of exceptional lightness and strength of parts, is referred to as explaining the fact that their sales for the past year or two have steadily increased.

The Henry Seymour Cutlery Company, Holyoke, Mass., it will be observed, on page 10 give some patterns of their Sheep Shears, and refer to this line of goods.

A recent confession of judgment by the Chicago Tire and Spring Works in favor of Charles H. Ferry for \$142,223.85 has been described in the Chicago daily papers as a failure. This, we understand, is not the case, as the transaction referred to is merely a step in the disentanglement of the affairs of the company, Mr. Ferry being the principal owner. He states that matters are now being rapidly arranged for a reorganization of the company, which he hopes to effect soon. In the meantime the works will continue in operation, their business having experienced no interruption during the litigation over the ownership of the property.

The American Bit Brace Company, 124 Washington street, Buffalo, N. Y., have recently been organized and have fitted up extensive works for the manufacture of Bit Braces. Mr. White of the former firm of Amidon & White is the president. Their announcement in regard to their enterprise will be found in the advertisement on page 30.

The Pope Mfg. Company, Boston, Mass., are sending to their customers the Columbia calendar for 1888. It is in the form of a pad, containing leaves, one for each day in the year, to be torn off daily, part of each leaf being left blank for memoranda. The

Trade Report.

pad rests upon a portable stand of convenient size and form to be given a place on the desk or table. Each slip, in connection with the date, gives an extract in regard to cycling from leading publications. The blank space for memoranda is so arranged that any given date can be turned to at any time.

It will be seen that the Edward Storm Spring Company, Poughkeepsie, N. Y., for whom John H. Graham & Co. are agents, 113 Chambers street, New York, in their space on page 7 give a letter referring to the satisfactory working of their Safety Dumb Waiter.

The Avery Elevator Bucket Company, Cleveland, Ohio, are sending out an ingenious and serviceable Match Receiver, in which one of their Buckets is utilized as the receptacle for the matches, the heavy card upon which it is mounted being used to call attention to their manufacture, and containing on the back the price list of their Buckets.

The Chicago Spring Butt Company, Chicago, Ill., issue a circular relating to their line of Spring Hinges, and stating that they have made a number of changes for 1888, among which these are mentioned: They have added a set-screw to hold every pin from working up; they have added a line of Japanned Hinges, with nickel springs, which they describe with a 1/2 number, and a large size No. 2 single-acting Hinge for doors 1 3/4 to 2 1/2 inches; they have changed the No. 7 Saloon Door Hinge to apply to doors having a scrollwork top, and have added a larger size No. 9 Fire Engine House Hinge for extra heavy front doors, and larger and oblique sizes of Bronze Metal Door Pulls, with a better adjusted price list. They have also applied a ratchet tension holder to their Garden City line of Hinges throughout, dispensing with the rivet as in the old style.

PRINTED MATTER FOR THE RETAILER'S CUSTOMERS.

Manufacturers of Hardware are exceptionally enterprising in keeping the trade informed in regard to their goods and issue complete, a tractive and in all respects satisfactory circulars, price-lists, catalogues, &c., which are fully illustrated, and enable the buyer of Hardware to advise himself thoroughly in regard to the different lines of goods which are offered for his selection. They very generally fail, however, in carrying the information in regard to their goods as far as it might be with advantage, their aim being to inform the dealer, while little thought is given by them as to how they can inform the consumer concerning the merits of the goods. In other lines of business manufacturers are careful to provide literature for general distribution as may be, which will advise the customers of the retailer in regard to the merits of the articles offered, a line of policy which is, however, in only exceptional instances followed by the Hardware manufacturer. There can be little doubt that the manufacturers of specialties—and in many cases of even staple goods—would find a larger market if more attention was given to this matter.

These remarks are suggested by a small pamphlet, 1 1/4 x 2 3/4 inches, which has just been received. It has a plain colored cover on which is printed, in neat and appropriate type, "The Place for the Mat and the Mat for the Place." On its title page inside it contains a cut of the Steel Wire Mat manufactured by the Hartman Steel Company, whose address at Beaver Falls, Pa., is given, with their offices in Boston, New York and Chicago. The body of the pamphlet is as follows:

What this Particular Mat is For and How it Does It.

There are two distinct uses for Door-Mats: One to take the worst of the dirt off, the other to finish.

The first Mat, that is, the first one you come to, receives a great deal of mud and dust; the second can be kept comparatively clean.

This primer is meant to make housekeeping easier, pleasanter, less expensive and more satisfactory—all by the proper use of proper Door-Mats. It is meant to save work in several forms, such as sweeping, house-cleaning, carpet taking-up and cleaning and putting down. It is meant to save money in carpets and rugs. It is meant to diminish all the discomforts that come of dirt and slovenly ways.

Consider a minute how Mats are used. Count out those untidy people who use none at all, and skip of the rest the nine-hundred-and-ninety-nine in a thousand who put one Mat inside the door and let their rugs and carpets take the rest of the dirt—wasteful people! They "save at the spigot and waste at the bung."

One in a thousand provides two Mats: A rough first Mat inside or outside to take the most of the dirt; and a finer one next to finish on.

That one in a thousand of housekeepers saves her labor, carpets and money and housekeeping comfort.

The Steel Wire Mat is the first mat. Its place is next the door, inside or out, according to how the house is built; outside is better if there is room for it there.

You come in from mud or slush, no matter how muddy or sticky. You step on the Steel-Wire Mat, scrape on it, stamp on it, leave the most of your mud or snow there; and wipe your feet dry on the pretty Manila Mat before you come to the rug.

But notice the difference: You are aware how soon a Rough Manila Mat in hard usage gets packed with mud. The Steel-Wire Mat is as clean and clean looking and clear after years of the hardest usage—as clean and clear as when new. In the midst of the muddiest time the Steel Wire Mat is clean. The scrapings are underneath. They only have to be swept away. The Mat itself, if mud ever sticks to it, clears itself with a little jar. But the mud doesn't stick to it. Clay, the stickiest clay, doesn't stick to it.

The best common Mat for a first Mat is Rough Manila. That you know all about. It is good enough when new, but little better than none when you want it in a muddy time; it is old in an hour or two in a busy, muddy time.

The Steel-Wire Mat is the proper first Mat. There is no other nearly so good. Manila is cheap to begin with; steel-wire is cheap to go on with.

Once in a while an invention comes up that discourages further pursuit of improvement. Who expects a better friction-match? or hammer? or corkscrew? or carpet? or Derby hat?

The Steel-Wire Mat is such an invention. It does all a first Mat ought to do. It is always ready; always at its best. No work at all to take care of it; not much to take care of the scrapings under it—far less than if tracked all over the house—far less than if they had to be beaten or washed to get them loose.

It probably settles the first Mat question forever.

We have treated of house use only. The harder the usage the better the Steel-Wire Mat. For public buildings, street cars, and all such places there is nothing approaching it.

The last page contains the retail prices of Mats of the different sizes, with the intimation that "any size and shape may be purchased at 75 cents a square foot, or a little more." While most of this matter relating to the special Mat in question is applicable to other Wire Mats, our readers will agree with us that the distribution of such a pamphlet would aid the retailer in selling the Mats, and similar enterprise shown by other manufacturers in different lines would result in securing increased sale of their goods. Retailers would appreciate the assistance given by manufacturers in marketing the goods, and would be more likely to purchase goods in which such assistance were given, while at the same time their customers would have their attention so directed to the articles as to be induced in many cases to purchase.

STATE OF TEXAS.

We give below extracts from recent letters from merchants in different States, which indicate the conditions which exist in their localities and the outlook for the trade of next year:

Texas.

WACO.—Crops this season were light, owing to the protracted drought and worms, and as a result business in all lines has been exceedingly light and collections slow. But our section has been blessed with copious rainfalls during the last month or six weeks, which will doubtless be conducive to a good yield in small grain. As to the prospects for cotton we are unable to speak for or against, as it depends in a great measure on summer rains.

DALLAS.—The outlook for business for the next six months is not by any means encouraging. While we have had a fair crop in North-Texas, there is a stringency in money matters from some cause. Crops have pretty much been all sold, and money seems to have been early distributed, mostly for paying up old scores, with no surplus left, and this is generally the case. We find that the interior merchants have not collected exceeding one-half of their outstanding debts, nor are not likely to collect them this season. This, coupled with other causes, will cause the best trade to pursue a conservative policy for some months to come, preferring to do less business and not granting long-time favors, as has been the custom.

NEW BRAUNFELS.—The buying will come to a total standstill after Christmas and New Year's, and I do not expect to make one-tenth the usual sales, as the people can not buy Hardware, and will only buy the necessities of life, as the crops here in cotton and corn were shorter than ever before to my recollection in 40 years, except in 1857, when there was a total crop failure. Besides depression in price and sales of stock is largely felt, as cows, calves, yearlings and two-year-olds cannot be sold at all, and can be bought at one-third the price at which they were sold two years ago. The only people that are doing well are the sheep men, as the wool crop never fails. They are also protected by the tariff, which gives them a good price, but we have but few sheep men around here, as we are an agricultural people and are mostly dependent on the crops. But as damp and rainy weather has set in, and most all our farmers have plowed their land, they will be kept moist, and if early planted with corn will make a sure crop if not killed by frost. So I hope by March, April or May, with a good crop prospect and a little activity in the stock trade, that business will be better than it looks now.

DUBLIN.—Up to this time trade has been satisfactory. Cotton and wool about all marketed. Stock quite low and in small demand, with money pretty well exhausted, indicating a light cash trade for the next few months. Wheat is looking fine and there is a good acreage sown. Rains abundant. Prospects for a crop in 1888 better than before in several years at this season. People generally taking fresh courage and renewing vigor.

WEATHERFORD.—Trade has been good up to this time and we look for a moderate business the balance of the winter. Cotton about all marketed. Collections have been better this season than we looked for in the early part of the fall. A large acreage of wheat has been sowed, and is now in good condition.

BALLINGER.—The Hardware trade has been good this fall, and the rainfall has been general and in abundance, so we expect a fair implement and Hardware trade in the spring.

Alabama.

BIRMINGHAM.—The general Hardware business continued good throughout November, and the outlook for the present month is better than we expected, as both November and December are considered "off" months with us. The large volume of business connected with the building of new railroads has fallen off perceptibly, as many of the contractors have completed their work and are no longer in the field as buyers. Collections have been slow for the past two months, but there is now a noticeable improvement.

SELMA.—General trade has been fair during the fall season. Some lines, such as stoves and railroad supplies, have been specially good. Plantation supplies of all kinds below the average. The present crop has been made largely with old Tools and Implements, on account of the general deficiency left from last year's short crop. We look for a fine trade in these lines upon the opening of another year. Conditions justify the expectation of a general improvement in the Hardware trade during the coming year.

GREENVILLE.—Our trade has improved within the last few weeks. Still it is rather dull, and we see no prospect of improvement of note owing to the shortage in the cotton crop, coupled with low prices of same, and in our section we have nothing to support trade except what our farmers make.

Mississippi.

MACON.—Crops in this section were somewhat shorter than we expected, but business has been very fair, and I think it will continue so the coming year.

VICKSBURG.—Crops compare favorably with former years, and with prices firmer, more encouragement is felt. There is enough building going on here to keep the Hardware trade active, but with our distance from the factory care must be exercised in making up large orders, owing to constant changes in prices and new goods being so rapidly introduced.

Arkansas.

SEARCY.—Business has been reasonably good this season. We do not expect a heavy winter trade. However, if we could get a little cold weather down here it would help the stove trade.

MORRILLTON.—Business to date is as good if not better than it was up to same time last year. It is a settled fact that our Cotton crop is short, and the business outlook not as promising as we would wish, though we venture the assertion that our country is financially better off this year than last on account of higher prices received for the crop, and the strict economy used by the majority of our farmers.

Minnesota.

WINONA.—Owing to short crops our trade in a few counties near Winona has been very much reduced from the figures of last year, but in Western Minnesota and Southern Dakota our sales have improved. Business has been quite seriously interfered with, however, along the line of our Western railroads, on account of their failure to furnish sufficient cars to move the produce. The result has been to close the local markets for want of storage room, and money has not circulated as freely as we had reason to expect earlier in the season.

WATERVILLE.—Trade in this section is good. We are in a heavy timber section. Wood and Logs are in good demand and good price, and the prospect for winter trade never was better.

SHAKOPEE.—Business was very fair during November, but since the first of this month trade is light, owing to bad roads. We are in need of snow. Collections have been fair. We look for light trade from new out.

ST. CLOUD.—Trade was very good up to December, sales exceeding those of last year by 20 per cent. Farmers' trade has been considerably lighter on account of light crops and low prices for produce and cattle. I look for a very light trade this winter until building operations open up again, which is about the middle of March. Collections have been better than expected.

Georgia.

COLUMBUS.—Business this fall is showing up an average amount, but just at present it would be difficult to state whether the prospect for winter trade will be good or poor, owing to a number of failures out in the country, which fact tends to demoralize business. It is near the opening of our spring trade (January 1), and we look forward to a fair business. Our customers are looking after collections now more closely than for trade.

CEDARTOWNS.—The cotton crop was materially shortened by the late drought. Rains seemingly out of season, but coming in connection with a late and open fall, proved very seasonable, and did much toward making a full yield of the staple crop, and as much toward retarding the sowing of a fair acreage of small grain and grasses in due season. The business prospects are good for the winter in general lines, and for the spring in ours.

FAIRBURN.—Although business is dull, farmers are beginning to inquire after goods, and the prospect is very fair for a good trade during the winter, especially in Farm Implements.

Iowa.

KEOKUK.—It is most too early to prognosticate as to trade the coming season. We cannot hope for anything but a fair trade, as crops the past season were a partial failure, and this being an agricultural country trade is altogether dependent on the crops.

COUNCIL BLUFFS.—Our fall trade has been as good as we expected. Winter trade so far is also fair, though many dealers are preparing to take stock the first of the year, and are not buying except such goods as they need for their immediate wants. We think the outlook for winter and early spring trade is encouraging.

Coal Market.

The near approach of stirring events in the Anthracite Coal trade, which in their effects are likely to prove decisive as to prices, and the whole course of the market, causes a state of waiting almost phenomenal in its dullness contrasted with the recent activity. Compared with one week ago there is less disposition on the part of the companies to sell ahead, and on the part of consumers there is a holding off in hopes of a favorable turn in their interest. The pivotal point is the future course of Reading on the wages question, nothing having yet been decided with reference to a renewal of the old arrangement expiring December 31. As stated by the Philadelphia Press, "the Reading Company can, of course, make no arrangement to pay an advance in wages after the Lehigh miners go to work, and President Corbin cannot say when that will be. The Schuylkill miners naturally desire that the arrangement for wages shall last a year. This suggests what will no doubt cause great trouble in the Coal regions during next year. The advance in the Schuylkill region cannot continue after the Lehigh strike ends, as the Reading company could not compete with the lower rate of wages there. Nearly all Coal men believe the men in the Lehigh region will soon go to work at the same wages as they were receiving when they struck." Prices in New York are quoted for Free Burning Broken, \$3.85 f.o.b.; Egg, \$4.25; Stove and Chestnut, \$4.75; Lykens Valley Broken, \$4.90; Egg, \$5.40; Stove, \$5.65; Chestnut, \$5.40, at shipping docks, f.o.b. Hard White Ash is practically out of the market. An adjustment of prices on a normal basis will be followed, it is surmised, by a rush of orders, promising an active winter, perhaps equal to the full capacity of the mines. The receipts of Anthracite for the week amount to 336,000 tons, an increase of 141,519 tons compared with the same week last year, and since January 1 32,733,000 tons, against 30,198,000 last year. Bituminous is active, and the Clearfield and Cumberland regions are 1,624,636 tons ahead of last year.

Cincinnati.

Office of The Iron Age, Fourth and Main Sts., CINCINNATI, December 19, 1887.

Pig Iron.—There has continued to be an active demand for Pig Iron and some liberal sales have been made, but in some instances at the expense of prices. The competition to book orders for next year's delivery has been lively among the furnaces, and shrewd buyers have considered it an opportune time to buy rather than wait until after the close of the year. Most of the Southern producers are now sold well ahead, some of them more largely than for a year or more. It is evident that the furnaces as a rule must have anticipated lower prices or they would not have contracted for such round amounts so far in the future, and it is equally apparent that buyers are satisfied with the recent decline or they would not have committed themselves to such an extent as they have. But with so much of next year's production already disposed of, and the inquiry still good, the outlook is favorable for a steady, if not a firmer, market during the fore part of next year. Interested parties believe they can see clearly ahead for the next six months, but the latter half of next year is shrouded in darkness. The sales which have been consummated here have been largely, if not entirely, of Coke Foundry Iron; Mill Iron being neglected. Car works and Stove men have probably been the largest buyers during the week, the aggregate sales being upward of 12,000 tons. Among the sales of significance were 1000 tons No. 2 Southern Coke Foundry Iron, at \$19, delivery commencing in February, running through 10 months; 500 tons do. on same basis, for delivery from January to June; 2000 No. 2 Ohio and Pennsylvania Coke Foundry a shade under \$19, cash, here; 2000 tons Southern Car-Wheel at \$23.85, cash, here; 4000 tons No. 2 Southern Coke Foundry at about \$19, cash, here, and 1000 tons of different grades, but sold upon the same basis; Lake Superior Charcoal has been sold at \$23, cash, here, and several thousand tons of Southern and Ohio and Virginia Iron not named have been sold, making good the aggregate. The quotations for cash here, f.o.b., are as follows: Hot-Blast Foundry Iron—Ohio and Southern Coke No. 1, \$20 @ \$20.50; do., No. 2, \$19 @ \$19.50; do., No. 3, \$18 @ \$18.50; Ohio Soft Stovecoal, No. 1, \$20 @ \$20.50; do., No. 2, \$19 @ \$20; Mahoning and Shenango Valley Coke, No. 1, \$20.50 @ \$21; Hanging Rock Charcoal, No. 1, \$23 @ \$24; do., No. 2, \$22 @ \$23; Tennessee and Alabama Charcoal, No. 1, \$21 @ \$21.50; No. 2, \$19.50 @ \$20.50. Forge—Strong Neutral Coke, \$17 @ \$17.50; Mottled, \$16 @ \$16.50; Cold Short, \$16 @ \$17. Car-Wheel and Malleable—Southern Car-Wheel Iron, \$23 @ \$24; Hanging Rock, C. B., \$24 @ \$25; Lake Superior Malleable, \$22.50 @ \$23.50.

Louisville.
LOUISVILLE, KY., December 19, 1887.
Pig Iron.—Dullness has been the leading feature of the Louisville market for the past week. The uniform reply of buyers to offers is that they intend deferring purchases until after January 1st. It is believed that buying will be quite active after that date, but at present there is nothing doing other than the filling of small orders for current needs. Foundry Irons are particularly slow in going off, and there are few inquiries for Car-Wheel grades. Owing to the low stocks at furnaces it is anticipated that there will be much trouble in filling the orders which will come in after the end of the year. An advance in price is almost certain to follow the beginning of the new year. Prices remain unchanged, but transactions are so few that many of them are practically nominal.

| | | |
|-------------------------------------|-----------|---------|
| Southern Coke, No. 1 Foundry | \$20.00 @ | \$20.50 |
| " " " " " " | " " @ | " " |
| " " " " " " | " " @ | " " |
| Hanging Rock, Coke, No. 1 Foundry | 19.50 @ | 20.50 |
| " " " " " " | " " @ | " " |
| Southern Charcoal, No. 1 Foundry | 22.50 @ | 23.00 |
| Silver Gray, different grades | 17.50 @ | 19.00 |
| Southern Coke, No. 1 Mill, Neutral | 17.25 @ | 18.25 |
| " " " " " " | 16.75 @ | 17.75 |
| " " " " " " | 16.75 @ | 17.75 |
| White and Mottled, different grades | 15.00 @ | 16.00 |
| Southern Car-Wheel, standard brands | 21.00 @ | 25.00 |
| Southern Car-Wheel, other brands | 22.00 @ | 23.00 |
| Hanging Rock, Cold Blast | 21.00 @ | 25.00 |
| Warm Blast | 20.00 @ | 21.00 |

W. B. BELKNAP & Co., Louisville, report as follows under date of December 19, 1887: We are gratified to report a remarkable volume of trade for this time of year. It is wonderful how the demand keeps up, and the market has an unquestioned undertone of strength to it. As soon as any weakness shows its head it seems to be promptly taken in charge and disappears. Nails, Wire, Bar Iron and pretty much the whole line are strong, but not high. As they are holding their own so well this close to the new year, it will not be surprising if certain advances are soon made. The general strength in the Metal market—Tin, Lead, Copper, &c.—is undoubtedly helping the cause of Iron. The bugbear of tariff reduction does not alarm the purchasing community; they are buying what they want, irrespective of future market, and we are inclined to think that the President's message on the whole will have an extremely healthy effect, inasmuch as it is certain to discourage importation for the present. This will throw the demand directly into the hands of the American manufacturers and redound to their benefit. Whatever changes are made will be made cautiously, and so gradually that we have an idea that they justify alarm no more than specie payment should have done. It seemed like a great day when it was approaching, but when it came it dawned and waned like any other in the calendar. Country merchants are restricting purchases on account of stock-taking and being taken up with Christmas goods. To offset this the weather has been open and dry, and outdoor work has progressed without interruption.

Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

| | | |
|-----------------------|-----------|-------|
| Heavy Copper | \$0.10 @ | 0.12 |
| Light Copper | " " @ | " " |
| Copper Bottoms | " " @ | " " |
| Brass, Heavy | " " @ | 0.05 |
| Brass, Light | " " @ | " " |
| Composition | " " @ | " " |
| Lead, Heavy | \$0.03 @ | 0.04 |
| Lead, Light | " " @ | " " |
| Zinc | " " @ | 0.03 |
| Wrought Iron | \$18.00 @ | " " |
| Light Iron | " " @ | " " |
| Stove Plate Iron | " " @ | " " |
| Machinery Iron | " " @ | 13.50 |
| Grate Bars | " " @ | 7.00 |
| Old Rubber | " " @ | 0.05 |
| White No. 1 | " " @ | 0.05 |
| White No. 2 | " " @ | 0.04 |
| Canvas, Linen | " " @ | 0.04 |
| Canvas, Cotton | " " @ | 0.03 |
| Canvas, No. 1 | " " @ | 0.02 |
| Seconds | " " @ | 0.01 |
| Soft Woollens | " " @ | 0.05 |
| Wired Rags | " " @ | 0.01 |
| Waste Haggling, No. 1 | " " @ | 0.02 |
| Waste Haggling, No. 2 | " " @ | 0.01 |
| Book Stock | " " @ | 0.02 |
| Newspapers | " " @ | 0.01 |
| Waste Paper | " " @ | 0.005 |
| Hemp Twine | " " @ | 0.01 |
| Sisal Baling Rope | " " @ | 0.01 |

The reduced tariffs on freight to Missouri River points, announced by the roads west of Chicago, went into effect December 20. The reduction amounts to about 20 per cent. on the tariff on the higher classes, this allowance being gradually reduced as it goes down the classification, until at the bottom it amounts to a much smaller percentage. The recent rates varied from 90 cents on the highest class to 20 and 16 on the two lowest. The reduction puts these same classes at 75 and 17 1/2 and 16. These rates apply between Chicago and Missouri River points, Council Bluffs, Omaha, Atchison, St. Joseph, Leavenworth and Kansas City. On rates to the same places from Mississippi River points a corresponding reduction takes place if the programme of the railroad companies is carried out. The freight agents of the Chicago east-bound railways, on Friday, agreed on an advance in export rates on all classes of business. The advance averages 15 per cent. over the present tariffs. It will go into effect December 27. Commissioners Fink and Blanchard decided that the Grand Trunk Railway is entitled to a differential of 3 cents per 100 pounds upon dressed meat traffic between Chicago and Boston. The company wanted a differential of 6 1/2 cents. It is also learned that the American transcontinental lines have agreed to interchange freight and passengers with the Canadian Pacific Railroad on terms satisfactory to the latter.

The Stewart & Mattson Mfg. Company, Philadelphia, Pa., who have during the past three or four years built up a large trade in artistic brasswork, furnishing ornamental work for the cars of the Pennsylvania Railway Company and for the Pullman Palace-cars, as well as fittings for yachts, are about resuming their old line of work in builders' hardware, locks, knobs, &c., for which they have excellent facilities at their factory North Tenth street, Philadelphia.

It is currently reported that in a battery recently brought out in Germany nickel and carbon are used as galvanic elements.

L. COES'
GENUINE IMPROVED
Knife Handle
PATENT
Screw Wrenches
MANUFACTURED BY
L. COES & CO.,
Worcester Mass.
ESTABLISHED IN 1810.




Patented July 6, 1886. Patent July 8, 1884.
Registered March 31, 1878.

Sectional view illustrates our NEW KNIFE HANDLE, showing Malleable Iron Frame and Shank of Bar keyed into position.
Straight Bar, Extra LONG NUT FOR SCREW IN JAW.

The Best Made and Strongest Wrench in the Market.
Send for Illustrated Price List and Circular.

J. C. McCARTY & CO.,
NEW YORK.
Sole Agents.

Hardware Dealers Take Notice,

and buy where you can get the best quality at the lowest price, thereby not only satisfying your customers, but also putting money in your own pocket.

Our Eureka Patent Flexible Back Saws, the teeth of which are hard, the back being soft, thereby preventing them from breaking in two, have been greatly improved and are giving the best satisfaction. Our Crescent brand of Hack Saws are hardened all through with uniform temper, and are the best Hack Saws so tempered.

We are now preparing to supply the wants of the trade according to their preference. Hardware Dealers run no risk by buying from us either our Eureka or Crescent brand of Hack Saws on our recommendation, as we give them the option of returning the first lot to us at our own expense any time within three months from date of invoice. Correspondence solicited.

Henry G. Thompson & Sons,

Cor. Elm and State St., New Haven, Conn.,

—MANUFACTURERS—

Flexible Back Band Saws for Cutting Metals,
Hack, Meat and Kitchen Saws and Frames.

SEND FOR CIRCULAR.

BRANCH OFFICE, 51 Leonard St., New York City.

JOHN W. McCLELLAN, Pres. CHARLES R. FOWLER, Vice-Pres. HENRY S. LANSFORD, Sec'y & Treas.

American Tin Zinc Company,
LIMITED.
Factory, SKYMOUE, CONN. 85 Beaver St., New York. Telephone Call, "PEARLERS."

TIN ZINC,
W. J. WILDER'S PATENT, March 10th, 1883.

A New Metal especially adapted for Roofing, Lining Refrigerators, the Manufacture of Britannia Ware and all Articles where Spun Metals are Required. An excellent Substitute for Tin Copper and White Metals.

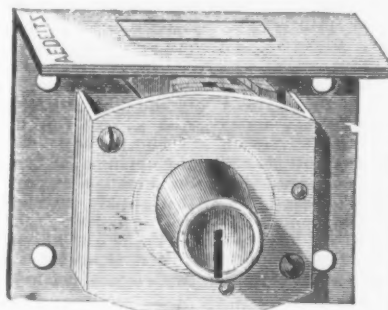
The F. F. ADAMS CO.,
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MANUFACTURERS OF

Rat and Mouse Traps,

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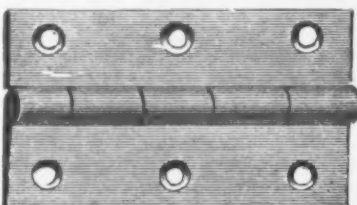
No. 51 Lathe.

J. C. McCARTY & CO., Agents,

97 Chambers and 81 Reade Sts.,

NEW YORK.

Factory, BROOKLYN, E. D. N. Y.

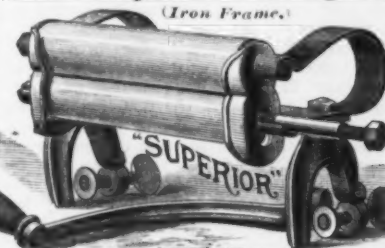


W. & J. TIEBOUT,
MANUFACTURERS OF

BRASS, GALVANIZED & SHIP CHANDLERY
HARDWARE.

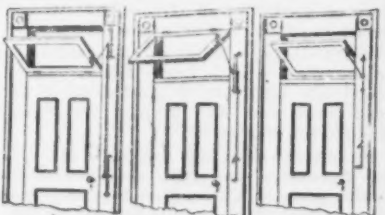
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NEW YORK

The "Superior Wringer."



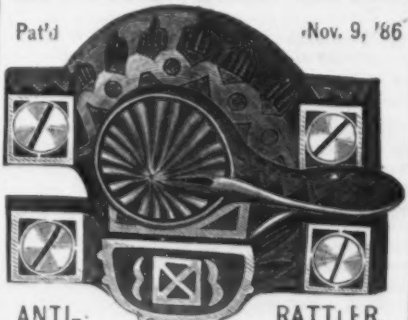
Fully Warranted. Has Patent Adhesive Rolls.
Best Steel Springs, Malleable Iron Crank.
Send for fully illustrated Catalogue and Price-List of thirty different styles and sizes of Wringers.
BAILEY WRINGING MACHINE CO.
WOONSOCKET, R. I.

Reihers' Improved Transom Lifters



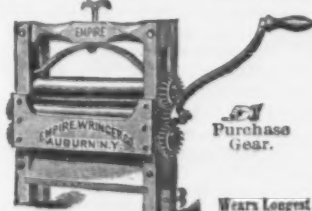
Best in the market. Send for Catalogue.
F. A. REIHER, Mfr.,
11 and 13 S. Canal St., - CHICAGO, ILL.

Security Sash Lock.



ANTI-RATTLE.
The Claffen Mfg. Co.,
(Cleveland, Ohio, U. S. A.) Sole Manufacturers

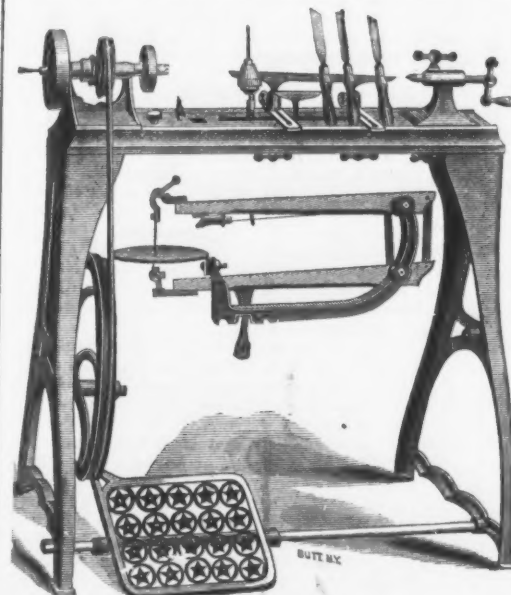
THE "EMPIRE" WRINGER.



Tub Wringers, Bench Wringers, Clothes Drying Bars, &c.
EMPIRE WRINGER CO., AUBURN, N. Y.

THE BEST AND CHEAPEST
WIRE NAIL
MACHINE.

Tack and Nail Machinery.
WM. A. SWEETSER, Brockton, Mass (39 Montello Street.)



Many kinds of Scroll Saws have been put on the market by ourselves and other manufacturers during the past twelve years. Of these only a few have proved good enough to remain in demand. The call now is for a well-made, practical machine, and all second-class ones are of slow sale.

Those who want a good Lathe with Scroll-Sawing Attachment and all Tools and Improvements to the very latest moment will buy the Goodsell Lathe.

Those who want only a Scroll Saw with Drilling Attachment, Rubber Blower and Lever Clamp will prefer the Rogers saw.

These two machines are taking the place of all others, and are now the most in demand throughout the world.

No dealer can make a mistake by laying in a stock of them. About Christmas time they are wanted in every town, and will make business lively at this otherwise dull season.

We also keep a full stock of Designs, Wood, and all other Scroll Sawing goods.

Price of Goodsell Lathe, complete, \$12.00.

Price of Rogers' Saw complete, \$3.50.

MILLERS FALLS CO.,

93 READE STREET, NEW YORK.

CHAMPLAIN
Forged Horse Nails.
MANUFACTURED BY THE
NATIONAL HORSE NAIL CO.,
VERMONT, VERMONT.
HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST NORWAY IRON AND WARRANTED.
WAREHOUSE
97 CHAMBERS AND 81 READE STREETS NEW YORK.
J. C. McCARTY & CO. Sole Agents.

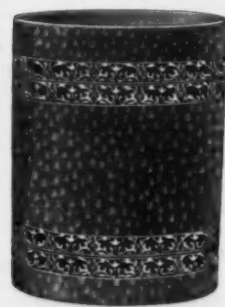
CHRISTMAS NOVELTIES.

Umbrella Stands, Waste Paper Jars



Seamless. No Metal to Tarnish.
Will not break if Tipped Over.

Decorated or Plain,
For Home Decoration.



Sold by all First-Class Dealers in Crockery, Housefurnishing Goods, Stationery, &c.

Union Indurated Fibre Co.,

110 Chambers St., New York. 39 Wabash Ave., Chicago.

PORTLAND, ME. MECHANICSVILLE, N. Y. LOCKPORT, N. Y.
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Double Acting Spring **BUTTS** SABIN'S LEVER DOOR SPRINGS
Coil, and Sabin's Volute Springs
For various purposes made to order.
SABIN MACHINE CO., Montpelier, Vt.

WALPOLE MILLS.

EMERY

SOUTH WALPOLE, MASS.

Foreign Markets.

EQUIVALENTS.

| From | Per cent of Lib. | Cent. |
|------------------------------|------------------|-------|
| France (Netherlands) | 100 | 100 |
| Spain (Netherlands) | 100 | 100 |
| Portugal (Netherlands) | 100 | 100 |
| Italy (Netherlands) | 100 | 100 |
| Germany (Netherlands) | 100 | 100 |
| Belgium (Netherlands) | 100 | 100 |
| Switzerland (Netherlands) | 100 | 100 |
| Austria (Netherlands) | 100 | 100 |
| Prussia (Netherlands) | 100 | 100 |
| Russia (Netherlands) | 100 | 100 |
| Sweden (Netherlands) | 100 | 100 |
| Norway (Netherlands) | 100 | 100 |
| Denmark (Netherlands) | 100 | 100 |
| Finland (Netherlands) | 100 | 100 |
| Poland (Netherlands) | 100 | 100 |
| Czechoslovakia (Netherlands) | 100 | 100 |
| Slovakia (Netherlands) | 100 | 100 |
| Hungary (Netherlands) | 100 | 100 |
| Romania (Netherlands) | 100 | 100 |
| Greece (Netherlands) | 100 | 100 |
| Turkey (Netherlands) | 100 | 100 |
| Syria (Netherlands) | 100 | 100 |
| Lebanon (Netherlands) | 100 | 100 |
| Libya (Netherlands) | 100 | 100 |
| Algeria (Netherlands) | 100 | 100 |
| Tunisia (Netherlands) | 100 | 100 |
| Morocco (Netherlands) | 100 | 100 |
| Spain (Netherlands) | 100 | 100 |
| Portugal (Netherlands) | 100 | 100 |
| Italy (Netherlands) | 100 | 100 |
| Germany (Netherlands) | 100 | 100 |
| Belgium (Netherlands) | 100 | 100 |
| Switzerland (Netherlands) | 100 | 100 |
| Austria (Netherlands) | 100 | 100 |
| Prussia (Netherlands) | 100 | 100 |
| Russia (Netherlands) | 100 | 100 |
| Sweden (Netherlands) | 100 | 100 |
| Norway (Netherlands) | 100 | 100 |
| Denmark (Netherlands) | 100 | 100 |
| Finland (Netherlands) | 100 | 100 |
| Poland (Netherlands) | 100 | 100 |
| Czechoslovakia (Netherlands) | 100 | 100 |
| Slovakia (Netherlands) | 100 | 100 |
| Hungary (Netherlands) | 100 | 100 |
| Romania (Netherlands) | 100 | 100 |
| Greece (Netherlands) | 100 | 100 |
| Turkey (Netherlands) | 100 | 100 |
| Syria (Netherlands) | 100 | 100 |
| Lebanon (Netherlands) | 100 | 100 |
| Libya (Netherlands) | 100 | 100 |
| Algeria (Netherlands) | 100 | 100 |
| Tunisia (Netherlands) | 100 | 100 |
| Morocco (Netherlands) | 100 | 100 |

GREAT BRITAIN.

SCOTLAND.

A large business has been done this week in the Glasgow Pig Iron market, especially on speculative account on the part of outsiders, and London orders have been placed for some heavy orders indeed, the inquiries from the South show that the operators there are having a keen eye on the Scotch Pig Iron trade. During the last few days there has again been a fair inquiry for Scotch Pig Iron from the United States, and it is generally believed that any lines of much importance have been placed. A very favorable feeling has been produced this week by the free trade indications given by President Cleveland in his annual message to Congress, and many persons are now hopeful of improved trade relationships being opened up with the States. That circumstance has given a very healthy tone to the market. Several makers of special brands of Scotch Iron have advanced their prices, and Scotch Hematite Iron has been raised in price by the makers 2 1/2 to 3 to 50/100. It is stated that orders have been given for the dismantling of the furnaces of the Monland Iron Company, whose various works were lately acquired by new owners by public auction. Of late there have been only two furnaces blowing. The Steel trade is now looking much healthier, and manufacturers are speaking with more confidence of the early future. Orders are now dropping in much more freely, and the makers have every prospect of being well occupied for some months; indeed, it is said that orders for about 40,000 tons have been booked by one firm. Although this increased briskness in the Steel trade is due to the numerous orders for new shipping placed with the Clyde builders during the past two months, which are said to amount to about 60,000 tons. There is also a lot of Steel wanted in the shape of blooms, etc., for shipment to America, and for bridge work. The dispute between the Steel Company of Scotland and some of the classes of their workmen has been amicably settled by a little bit of mutual "give and take." Basic Steel blooms, etc., to the extent of 100,000 tons, were sent from the Glasgow Steel Works last week for shipment at Ardrossan for South Wales. Iron and Coal Trades Review, December 9.

CUMBERLAND.

The Cumberland market for Hematite Iron has also improved, and with even much better reason than Scotch Iron, for the increased demand for Steel of all descriptions has induced the Steel works to buy largely, and, besides that, makers have also made some good sales for storing purposes to supply the speculative demand. The restriction previously agreed to has come into force, some of the furnaces have been blown out, and others changed from iron into Spiegel, while several are damped down on Sundays. The reduction of wages, to the extent of 5 percent, intimated to the men employed at the Ironworks in Cumberland, has not been agreed to by the latter, and, in consequence, notices have been posted up last Saturday at seven of the works that all engagements terminate in 14 days. From these various causes makers have very little to sell for the time being, and a number of them feel no more anxious to quote at all, while others ask higher prices. We quote 4 1/2 to 4 3/4 for Nos. 1, 2 and 3 Bessemer, f.o.b. usual shipping p.r.s. The business in West Cumberland Hematite Warrants during the last eight days was at 4 1/2 to 4 3/4, cash, and 4 1/2 to 4 3/4, a month open, and prices closed with buyers at 4 1/2, cash, and 4 1/2 to 4 3/4, a month, sellers 1/2 more; other Hematite warrants 1/2 to 3/4 below this. There are now 87,310 tons of Hematite iron in the West Cumberland storing Company's Stores, being an increase of 931 tons since the 28th ult. Furnaces in blast in this district, 40.—R. Feildman & Co., December 9.

SOUTH WALES.

In the South Wales Iron trade there is more business doing, and that more sanguine views are entertained respecting the future is indicated by the rumor respecting the re-starting of various establishments which are now idle, among them the Hirwaun Works, once a property of Mr. Wm. Crawshaw, and now acquired by a Sheffield company. The Porthugh Works are likely to be reopened also. The Steel manufacturers are tolerably well occupied on Tin Bars and Blooms, but there is a dearth of orders for Rails, Iron, and Cast Trades Review, December 9.

THE MAKE AND DISPOSAL OF PIG IRON IN CLEVELAND.

The Cleveland Ironmasters' Association have just issued from their office at Middleboro' their monthly returns showing the make and disposal of Pig Iron during the month of November. The statistics are considered satisfactory. Of 150 blast furnaces there are 93 in operation. The total production of these furnaces amounted to 353,130 tons. This is a decrease of 1,613 tons on the month of October. The stocks of Pig Iron now stand at 229,915 tons, being an increase of only 174 tons on the previous month.—Engineering.

TIN PLATES.

This has been another week of excitement, and in common parlance it is best expressed as a week of "ups and downs," and it has all been caused by the vagaries of the Tin market. There was a strong demand for tin plates daily, but prices varied—last week's prices were hardly maintained this week. Coke Tin Plates and Best Charcoal Tin Plates have been looked at the close of last week at 15 1/2 to 16 Liverpool, with not many sellers, most of the quotations being 15 1/2 to 16 1/2; but with the first drop in Tin came numerous sellers of Tin Plates at 15 1/2 to 16, and even 15 1/2 to 16 1/2, and consequently there was an increased demand for these, being so much superior to Bessemer. Waters have been in good demand, and 14 1/2 to 15 are the prices. There has been a better demand for Charcoal and Best Charcoal Tin Plates lately, and there being more Tin used in their finish than in that of the Coke grades, the prices are, of course, very much higher. These are pretty firm at present, and Tin Plates have been for delivery this and next week. There has been a risk of a heavy fall in the face of such an uncertain Tin market. As prices of Tin Plates may drop at any moment Tin cases off, to prefer waiting in order to see what Tin will ultimately settle down at.—Calders Guardian December 9.

BRAZIL.

PARA, December 16, 1887.—India Rubber.—A heavy business has been done, purchases as far as this month aggregate 180 tons at an equivalent of 74, cash, which clears the market. The chief buyers are said to be the same parties who have been recently bearing the market through the medium of the public press. One of whom has purchased upwards of 20 tons this month. London also reports higher prices and there 10 tons fine Para having been sold to manufacturers at 37d, with large buyers at 36 1/2.—Pe. cable direct.

WEST INDIES.

PORT OF SPAIN, TRINIDAD November 11, 1887.—Apparatus.—Our market has been moderately active and steady during the fortnight at 9 1/2 to 10, and 9 1/2 to 10, and there have been some orders from here since January 1, 1887, 12,567 tons, against 9,109 last year, and 79,161 in 1885. Exchange, The Colonial Bank is a seller at 44 1/2, and a buyer at 44 1/2, 90 days.—E. P. Mason.

EAST INDIES.

MANILA, Nov. 28, 1887.—Hemp.—Has been quiet at \$9.50, which equals 2 1/2 to 3, cash, freight and insurance 1/2 to 1, against 2 1/2 to 3, last week. Week's receipts, 19,000 bales; total receipts since January 1, 465,000 bales. Shipments to England per steamer, 157,000 bales; per sailing vessel, 53,000 bales; to the United States, 285,000; to other countries and local consumption, 41,000. Loading for the United States, 14,000. Freight to England, 2 1/2 to 3. Exchange, six months' sight credit drafts, 3/4.—Smith, Bell & Co.

PENANG, November 1, 1887.—Tin.—Fortnight's receipts have amounted to 12,500 piculs, while Europeans bought 14,000 and Chinese 1000 piculs. The price has gradually risen from \$38.50 to \$42.75, in order to close at \$42.68, which was paid for Europe. The rapid advance has caused Tin

to be reimported from China. Since January 1 there were shipped to England 128,344 piculs, against 125,401 in 1886 and 129,430 in 1885; to the Continent, 2468, against 2314 and 1152, and to the United States, 11,350, against 30,582 and 18,452. Exchange, four months' Bank, 3/4.—Schmidt, Kautemann & Co.

SINGAPORE, October 23, 1887.—Tin.—Our market has been excited, 200 tons bringing 41 1/2 to 42 1/2 picul; toward the close holders withdrew from the market. Shipments from January 1 to the 26th, amounted to 16,629 piculs to England, 54,433 to the United States and 32,582 to the Continent. *Gutta Percha*.—The light arrivals have been readily taken at full previous figures, say, prime at \$77 to \$92 1/2 picul, medium at \$40 to \$50 and white at \$18 to \$19. *India Rubber*.—While lots arriving are moderate in amount, the demand is active; some 30 tons changed hands at \$54 to \$54.50 for hand some quality and \$52 for inferior. Exchange, four months' Bank, 3/4.—Guthrie, Wood & Co.

SPAIN.

BILBAO, December 1, 1887.—Metals.—Following are the official Export returns from Spain for the first nine months.

| | 1885. | 1886. | 1887. |
|-------------|-----------|-----------|-----------|
| Calamine | 27,616 | 21,140 | 20,608 |
| Pyrites | 630,640 | 515,094 | 594,779 |
| Pig Iron | 3,063,721 | 3,316,242 | 4,202,415 |
| Old Rails | 12,416 | 21,072 | 25,905 |
| Precipitate | 23,800 | 20,807 | 19,499 |
| Quicksilver | 308 | 540 | 1,118 |
| Pig Lead | 88,352 | 82,301 | 96,168 |

Totals... 3,559,081 4,020,553 5,113,170. It will be noticed that Calamine and Precipitate show a slight falling off, all other articles showing an increase.—*Bilbao Maritime y Comercial*.

HOLLAND.

ROTTERDAM, December 1, 1887.—Tin.—During the past 10 years the Netherlands Trading Company held the following Banca Tin auctions:

| Year. | Slabs. | Flasks. | Flasks. | Flasks. |
|-------|---------|---------|---------|---------|
| 1878 | 126,759 | 35,40 | 40,35 | 31,07 |
| 1879 | 136,132 | 31,55 | 38,376 | 51,55 |
| 1880 | 110,238 | 49,376 | 59,06 | 52,73 |
| 1881 | 135,592 | 52,636 | 64,00 | 55,56 |
| 1882 | 136,281 | 58,026 | 65,026 | 55,34 |
| 1883 | 125,310 | 53,50 | 64,75 | 55,10 |
| 1884 | 129,955 | 46,50 | 53,126 | 50,66 |
| 1885 | 135,823 | 48,126 | 56,75 | 52,83 |
| 1886 | 135,087 | 55,50 | 63,376 | 59,11 |
| 1887 | 136,000 | 61,126 | 68,876 | 60,00 |

1878-1888... 1,917,981 Ten years' average... 50,33.

Price obtained at November 30 sale... 98,874.

At ruling prices there are hardly any bona fide sales, but there is instead a movement between Holland, London and New York that has taken the place of deliveries. Out of the 20,838 Slabs, B-nas and billions, delivered in November 6900 went to London and 2000 to New York. The shipments made from producing countries in November, as shown in the returns, are in reality of little statistical value, since they mislead as to winter production, which is on the increase, and considerably so. Following are particulars of the sales that came off this year: 1st January, 21,060 Slabs, at 61.126; March, 21,125, at 62.126; May, 23,498, at 62.75; July, 23,297, at 63.376; September, 23,690, at 63.25; and November, 23,690, at 63.25; together 136,040 Slabs, at an average of 62.00.

Deliveries in Holland of 1887, 1886, 1885, Banca and Billions dur. Slabs. Slabs. Slabs, ing the first 11 months... 224,170 198,565 230,112.

Visible supply... 136,650 140,763 143,904.

Flasks. Flasks. Flasks.

Price end of November... 61 1/2 to 64 1/2.

GERMANY.

HAMBURG, December 10, 1887.—Iron.—The high ocean freights sustain Domestic Iron Ore at the advanced rates. Pig Iron is firm, and tends upward in consequence; the prolongation of the German Pig Iron convention to December 31, 1888, also tends to strengthen it. Prices have been raised 1 to 1 1/2 marks per ton. Spiegel is in the market for export, but tolerably firm, nevertheless, Forge Pig has been sold out for the first quarter of 1888, and the price is now 1 1/2 marks per ton higher, the range being 46.00 to 48.00. Foundry Pig has also been raised; the range is now 49 to 50 marks. The price of Thomas has been fixed at 44 and of Bessemer at 43.50. The rolling mills are sufficiently booked for a number of months ahead, but, as usual in winter, specifications are given slowly. Hoops enjoy an exceptionally high demand just now, and stocks thereof are so much reduced on all hands that everybody seems anxious to secure some. Negotiations are still on foot to induce certain makers who make tanks and pipes to join the syndicate. For the present all makers of hoop iron are left free to sell the same the best they can, and the quotation is 127.50 to 130. Boiler plates remain steady; they command from 5 mm. upward 130 marks, and there are indications that they will soon be raised. Thin Sheets are in satisfactory condition. The wire cranes also reports steadiness, and so do machine shops and foundries, with an increasing demand clearly perceptible, there being a favorable contrast, as compared with November. Several works in the West-Union business as they ever did before, though not on as remunerative a basis as they would wish. Metals.—Consumers are not prepared to subscribe to the advance, and prices are nominal.—*B. Zeehandel*.

FRANCE.

PARIS, December 10, 1887.—Metals.—The precipitate advance in England and Holland prevents dealings in this market, and as consumers are holding all of quotations are irregular; to attempt giving them would be useless just now, as the markets are unsettled and unreliable. Iron.—negotiations have been going on to find a proper basis for a common sales office for rolling mill products, and the two main groups of makers seem to have arrived at an understanding. Dealers in Paris have raised their prices by anticipation to 13.50 to 14 francs per 100 kg. Merchant and 13 francs Beams. Of course consumers resist the advance, and, as instances of concessions were unavoidable to catch a bargain for larger lines. The Marne district the price of Merchant has been pushed to 13 francs. The ministerial crisis keeps the temporary admission question in abeyance for the moment. The wire cranes held a meeting in this city for the purpose of forming a syndicate. All sheet iron mills in France are loaded down with orders at present, and No. 2 Sheets are bringing in the Northern Department 15 francs with ease, and they are quoted 17 francs here.—*Moniteur des Inter. et Matieres*.

BELGIUM.

BRUSSELS, December 10, 1887.—Iron.—The Belgian iron markets throughout exhibit great firmness, nor could this hardly be different in view of the strong position of Pig Iron, which is getting positively scarce. At this session Pig at 4.30 all the way to July 1, 1888. Between July 1 and November 15, 30,000 tons were delivered of Forge Pig alone. Foundry Pig is perhaps a little less strong, though we do not perceive any abatement in the demand at 4.90 to 4.95. Finished iron remains firm on the spot and for near deliveries, less so as regards distant futures, some makers seeming to apprehend less favorable times toward spring.—*Moniteur industriel*.

After trying various materials the shipping community, by common agreement, pronounced Portland cement to be the most trustworthy substance with which to protect the horizontal portions of the inner surface of an iron ship's bottom. At the present day scarcely any other covering than this is employed, the only variation being in the proportion of sand which is added to the cement and in the extent to which such substances as brick, broken tile and coke are incorporated with the cement at places requiring a more than ordinary thickness of the protective material.

Herr Franz Carl Guilleaume, one of the great captains of industry of Germany, of the firm of wire manufacturers Felten & Guilleaume, Cologne, died on the 1st inst., at the age of 53 years.

Sawdust is now sent to market in bales, very strongly compressed.

Iron Making in the Birmingham District.—III.

The vexed question of the cost of making coke iron in the Birmingham district need not be entered into except as far as it affects THE POSITION OF THE DISTRICT IN THE MARKETS OF THE COUNTRY.

A few years since the cost was estimated above \$12 per ton. We have every reason to believe, from data submitted, that to day the cost has been considerably lowered, and that, according to the circumstances favoring the one or the other producer, it is within the limit of \$10.50 and \$11.50, including fair allowances for interest on plant, a moderate royalty charge on ore and coal for exhaustion of lands and a safe margin for ordinary repairs, replacement, taxes and cost of water. Accepting the higher figure, and making allowances for freights, commissions, insurance, we find that the furnaces of the Birmingham district can lay down their iron for the average of the grades without suffering any pressure at \$15.75 to \$16 at New York, at \$16 to \$16.50 at New England points and at \$15.50 to \$16 at Cincinnati. Some of them can do it more cheaply; but at the figures named, with plants run fairly well, and producing about 2000 to 2200 tons a month, as the majority of them do, the makers in the district would meet the market without suffering. In other words, when standard irons are selling at tidewater at \$15.50, \$16.50 and \$17.50 respectively for gray forge, No. 2 and No. 1, Southern irons could still hold their own. This means that producers in the Lehigh Valley should be in a position to make their product at \$15 to \$15.50 to hold their own. Those acquainted with the district know that under ordinary conditions of ore and fuel supply a large percentage of the iron produced for the open market in the Lehigh Valley is made at less than that figure. On the other hand, nearly all the smaller companies, who depend upon the open market for their hematite and magnetic ores, and who are so located as to be at the mercy of the coal roads, cannot touch so low a cost. The smaller furnaces on the Hudson River are unquestionably better placed. The higher cost to a considerable number of the furnaces tributary to tidewater and New England markets is due to a variety of causes. One of them is the relatively high cost of fuel, and in the case of some plants the policy of the railroad company upon which they happen to be dependent of loading the furnace owner down with all the freight charges his business is supposed capable of bearing. Another cause is the fact that local hematite ores are growing leaner and scarcer, and that growing depth is telling on the cost of mining in some of the magnetic ore districts, notably New Jersey. There, with a few exceptions, in which the plants take rank with the best in the country, the furnaces of the Lehigh Valley and other districts tributary to tidewater markets have remained far behind in the march of progress. Fuel consumption is high, product low in quantity, with all that that implies. And yet we know of small furnaces, using their own ores, whose monthly cost sheets at times run as low as \$9.50. How far modern plants, located at points favorable to the purchase of cheap coal, in easy reach of an ore supply and in proximity to the largest markets, could reduce costs is a problem toward the solution of which we have no data beyond the indications furnished by the work of some of the latest plants. These, indeed, are encouraging to those who might desire to embark in the business. But dealing with the industry as it exists to day a candid survey of the situation will lead to the admission that if it should come to a struggle between the furnaces in Eastern Pennsylvania, New Jersey and New York, which produce chiefly foundry brands for the open market, and the makers of the South no inconsiderable number of the former would be unable to survive very long. Of course we except entirely from this discussion the furnaces which are run merely to supply pig iron to mills or steel works belonging to the same companies and the plants running on Cornwall ore.

Whether or not this is a problem which the weaker furnaces will have to face at an early date or not will depend largely upon the course of the markets during the next six months. Any material falling off in the consumption of pig iron accompanied by falling prices, even if largely compensated for by a decline in ore, fuel and freights, would force the issue with at least some of them. In what spirit they will meet it and to what extent the producers of anthracite coal and the railroads will aid them remains to be seen.

West of the Allegheny Mountains the struggle when it comes may become far more desperate should the makers in Ohio and Western Pennsylvania succeed in obtaining the cheap coke and the lower rail freights on Lake Superior ore to which they are entitled and which have been so obstinately denied to them. With modern plants, some of which are producing double the quantity of iron made in the average of Southern furnaces, with better fuel, far better ores and near-by markets, their position is intrinsically stronger.

That is the situation, so far as we can judge from the facts and opinions gathered. These conclusions may be modified by additional evidence, which we shall be glad to submit to the trade when coming from authoritative sources. We need hardly state that we are not actuated by any feeling of hostility to any section, as some Southern newspapers hasten to assert, because we have not found everything *couleur de rose*, and have not hesitated to say so. Nothing would be more dangerous than to attempt to underestimate the capacity as a rival of any new producing district, at home or abroad. To some extent the growth of iron making in the South, largely legitimate, but in some parts of Alabama undoubtedly unduly fostered for speculative purposes, involves a partial displacement and readjustment of the pig iron industry. It will be conceded that in periods like that of 1886 and 1887 of an exceptional demand full employment is given to all; that the Southern pig iron production, together with the ore developments of the Northwest, did much to

keep important us within limits, and that the natural growth of the country demands the opening out of new resources. Yet it will be conceded also that the superior advantages of virgin ore and coal property over territory worked for a long period tell in times of depression. We must be prepared for great spurts in the demand, but that very necessity implies sharp struggles in times of moderate requirements or of downright depression. It is well to wish the best to all sections of the country, but in times of intense competition which is only rarely relieved the best interests of the trade of the country at large demand that the capacity of the contestants be fairly and accurately gauged. Local newspapers may, and naturally do, take sides, but to those who desire to discuss the course of events from a broader plane sectional issues must disappear.

LOCAL ROLLING MILLS.

One of the most interesting phases of Southern development in which the Birmingham district has shared is the building of rolling mills and foundries. The idea has been too prevalent among iron masters generally that the works thus founded seek and find an outlet for the bulk of their make at home. However that may be in the future, at the present time, in spite of the intense activity of a period of construction and building, only a part of the local make, and in rolled iron only a small part at that, is marketed near home. Among the numerous small industries among which foundry irons are scattered the case is somewhat different.

From this point of view the most important enterprise in the Birmingham district is THE BIRMINGHAM ROLLING MILL COMPANY, of which J. G. Caldwell is president, Thomas Ward, general manager, and J. D. Dwyer is superintendent. The company have a capital stock of \$500,000. During the current year the works have been enlarged. In the Old Forge there are ten double and two single puddling furnaces and a scrapping furnace. The New Forge, 320 x 90 feet, contains 22 single puddling furnaces and a heating furnace, the latter nearly completed. In the Old Forge there is one 18 inch muck train, with two sets of rolls driven by its own horizontal engine, with 32 inch steam cylinder, 4-foot stroke, and a 40-ton fly-wheel. It has a squeezer with its own engine. The New Forge has a muck train with three sets of rolls, one two-high roughing and two three-high finishing, driven by the same size of engine as the train in the Old Forge, both of them having been built by Ainsley, Cochran & Co., of Louisville, Ky. The mill contains also a 16-inch three-high bar train, with 30-inch engine, 3-foot stroke and 30-ton fly-wheel, two 8-inch guide mills driven by a 24-inch engine with two 10-foot fly-wheels and two 22-inch belts. A 24-inch plate mill has 8-foot soft rolls and 5 1/2-foot chill rolls, being driven by a 36-inch engine, 5-foot stroke and 50-ton fly-wheel. Then follows, run by the same engine, a 24-inch sheet mill. The mill is supplied with 16 double-plate steel boilers, 42 inches in diameter, 30 feet long, four of them now building approaching completion, supplied with water by two steamboat doctors pumping water to a tank placed at a high point. The works have ten heating furnaces one softening furnace, and two box annealing furnaces. They will build two Siemens gas heating furnaces, one 20-ton and one 25-ton, for the plate mill. The mill is equipped with a plate shears capable of slitting sheet 5 feet wide, and cutting plate 1 1/2 inches thick. All the shears, the machine and repair shops, pug mills for fix, &c., are driven by separate engines, the total number in the mill being 23. For fix, Iron Mountain ore, Missouri and Cartersville brown ore, is used, all efforts to employ local ores having proved unsuccessful. The tap cinder is not utilized. The works have a tract of 20 acres, the mill being very well equipped with facilities for receiving raw materials, coal and pig being drawn from local supplies, the cheap pig being the main advantage which the works enjoy. The Pratt coil is of tolerable quality for rolling mill use, though it clinkers heavily on the grates. An item of serious cost is that of fire-brick, which must be procured from Maryland. The mill is well tracked, and in some parts has an admirable system of flooring with pierced cast-iron gratings. Coal is run directly by elevated track in the railroad cars to the furnaces. The company are just putting in an electric light plant of four arc lights and 150 incandescent lights, power to be furnished by a 40-horse Ball engine. The works produce rounds from 5 inches to 1/2 inch, squares from 3 inches to 1/2 inch, flats from 8 inches to 1/2 inch, angles up to 3 inch, and T rails from 10 to 30 pounds. For the latter there has been a heavy demand during the past two years. The mill produces all sizes of plates and sheets, the largest plate made at the mill having been 38 feet by 30 inches by 1/2 inch. The works produced last year over 22,000 tons of finished products. With the new forge the capacity will be increased to 30,000 gross tons. At present the consumption of pig iron is about 2500 tons per month, old rails being used sparingly. The local market thus far has been of relatively small importance, the product being shipped to the South and Southwest, going as far as California. Until freight rates became unfavorable an outlet was found also in Chicago.

THE BESSEMER ROLLING MILL COMPANY, of which H. F. de Bardeleben is president, L. E. Bruns is secretary and treasurer, and Lewis Jones is general manager, are a corporation with \$600,000 capital, who are building a rolling-mill on a tract of 14 acres, donated to them, in close proximity to the Bessemer furnaces. The company have purchased and have erected an iron truss-roof building, once a part of the buildings of the Centennial Exhibition and later of the New Orleans Exhibition. This building, which has been considerably strengthened, is 564 x 100 feet, to which a further addition of 100 feet is to be made, making the total length 664 feet. The plant will consist of 24 single puddling furnaces, finished with the exception of the stacks, on which work is now going on, and one scrap furnace. The

mill is to contain a 16 inch three-high muck train, a 22-inch two-high sheet train, with 42 inch finishing rolls, and a 24-inch three-high plate mill. These are to be driven by two horizontal engines with 36 inch steam cylinders, 5-foot stroke and 32-foot fly-wheel, weighing 54 tons, built by L. Spence, & Co., Martin's Ferry, Ohio. The foundations for one of these engines are being put in, while excavation for the foundation of the second is under way. A small Hamilton-Porter engine is to drive a 16 inch bar mill, an 8-inch guide mill and a 10-inch train. The mill is to be supplied with steam by two batteries of five boilers each and one battery of two boilers. It is to be equipped, also, with three Siemens regenerative heating furnaces. The bulk of the rolling mill machinery, supplied in about equal parts by the Lewis and Garrison foundries, of Pittsburgh, is at the works. The castings for the puddling furnaces have been made by Lloyd, Booth, & Co., of Youngstown, Ohio. The estimated capacity of the plant is about 100 tons of finished iron per day, and it is expected that the works will be in operation in about four months.

The third rolling mill enterprise of Birmingham, now in course of construction, is

THE ALABAMA ROLLING MILL COMPANY,

of which Fred. Sloss is president; W. H. Hassinger, vice-president and general manager, and C. A. Borts is superintendent. The company are composed of Ohio, New Orleans and Birmingham capitalists, the capital stock being \$250,000. The plant is located at Gate City, 5 miles northeast of Birmingham, on the Alabama Great Southern, Georgia Pacific and Georgia Central railroads, with the Louisville and Nashville Railroad building in. The ground occupied by the mill and cottages for the men is 30 acres. The finishing mill is 160 x 140, and the forge, 72 x 176, joins it at right angles. The forge contains 14 single puddling and two scrap furnaces, all made by Lloyd, Booth & Co., of Youngstown, Ohio. The rotary squeezer, made by same firm, is capable of turning out a ball 18 x 6 1/2 inches. The muck train is an 18 inch three-high. The finishing mill has 8-inch and 16-inch three high train, made by Lewis & Co., of Pittsburgh. The muck train is run by a 550 horse-power Porter-Hamilton engine from W

Imports.

The Imports of Iron and Steel, Hardware, &c., at this port from December 12 to December 16, inclusive, were as follows:

| Iron and Steel. | |
|--|--------|
| Pig Iron: Cracker Bros. | 200 |
| Spiegelberg: Naylor & Co. | 400 |
| Steel: G. Lundberg | 112 |
| W. F. Wagner | 13 |
| C. A. Walsch | 10 |
| J. Abbott & Co. | 9 |
| C. F. Baker | 34 1/2 |
| Newton & S. | 15 1/2 |
| Steel Rods: Montgomery & Co. | 28 |
| R. H. Wolf & Co. | 22 |
| Cary & Moen | 16 |
| F. S. Filditch | 15 |
| J. Lumb | 15 |
| Iron: Gustaf Lundberg | 37 |
| Steel Forging: Thos. Prosser & Son .. | 55 |
| Steel Nail Rods: J. Abbott & Co. | 32 |
| Steel Wire, Ropes: J. W. Nelson & Co. .. | 12 |
| Steel Sheets: A. R. Whitney & Co. | 12 |
| Calance & G. Mfg. Company | 6 |
| C. W. Power | 5 |
| Newton & S. | 2 |

| Tin Plates. | |
|--|-----|
| T. B. Coddington & Co. | 179 |
| Corset Steel: R. H. Wolf & Co. | 26 |
| Rivet W. Rods: Gustaf Lundberg | 42 |
| Muller, S. & Co. | 38 |
| Sheet Iron: T. B. Coddington & Co. | 61 |
| Hoop Iron: T. B. Coddington & Co. | 252 |
| Swede Iron: H. N. Holt | 125 |
| Old Iron Fish Plates: Neumark & Gross .. | 46 |
| J. & W. Seligman | 236 |

| Metals. | |
|------------------------------------|---------|
| Tin: Naylor & Co. | 122,118 |
| Copper: Muller, S. & Co. | 8,840 |
| Nickel: Emerson Foote | 2,650 |
| Type Metal: Jas. Fraser | 230,800 |
| Bi-muth: Chas. Fisher & Co. | 2,225 |
| Tags: T. B. Coddington & Co. | 116 |
| Phelps, Dodge & Co. | 130 |
| Antimony: Phelps, Dodge & Co. | 50 |
| American Metal Company | 35 |
| Dickerson, Van Dusen & Co. | 34 |

Exports of Metals from December 12 to December 16, inclusive.

| | |
|-------------------------------------|-----------|
| Old Copper: Burgess & Co. | 28,432 |
| A. D. Straus | 1,085 |
| Copper Matte: Williams & Terhune .. | 1,871,780 |

Hardware, Machinery, &c.
Bank of British North America, Mach'y, cs. 8
Baker, Hermann & Co., Mdse, pkgs. 4
Cary & Moen, cs. 23
Clark, G. A. & Bro., Mach'y, cs. 19
Curley, J. & Bro., cs. 6
Downing, R. F. & Co., Ironware, pes. 208
Field, Alfred & Co., Arms, cs. 10; Mdse, cs. 4
Gray Bros., Mach'y, pkgs. 27
Hartley & Graham, Arms, cs. 15
Lazard Freres & Co., Steelware, cs. 2,6
Schoverling, A., Arms, cs. 35
Schoverling, Daly & Gales, Arms, cs. 35
Schwartz, Julius & Co., Mach'y, cs. 23
Taylor, Thos., Mdse, cs. 6
Uhlmann, S. & F., Mach'y, cs. 53
Ward, Jas. E. & Co., Ironware, cs. 50
Wiesbusch & Heger, cs. 23
Witte, John G. & Bro., Halter Chms, cs., 2
Order-Hdw., cs., 1; Mach'y, pes., 4; do., cs., 7

Paints, Oils, &c.

| Paints. | |
|---|----------------|
| Black, Lamp-Coach Painters' | 2 1/2 @ 24 1/2 |
| Ordinary | 6 @ |
| Black, Ivory Drop, fair | 12 @ 15 1/2 |
| Best | 24 @ |
| Black Paint, in oil, kegs, 84; assorted cans, 114 | |
| Blue, Prussian, fair to best | 40 @ 55 1/2 |
| Chinese dry | 70 @ |
| Ultra-marine | 18 @ 30 1/2 |
| Brown, Spanish | 14 @ |
| Van Dyck | 10 @ 13 1/2 |
| Dryers, Patent American, ass'd cans, 94; kegs 74 | |
| Green, Chrome in oil | 14 @ 18 1/2 |
| Green, Paris in oil | 14 @ 18 1/2 |
| Green, Paris in oil, good, 30; best, 35 1/2 | |
| Iron Paint, Bright Red | 10 @ 24 1/2 |
| Iron Paint, Brown | 10 @ 14 1/2 |
| Iron Paint, Purple | 10 @ 14 1/2 |
| Iron Paint, Ground in oil, Bright Red | 10 @ 24 1/2 |
| Iron Paint, Ground in oil, Red | 10 @ 24 1/2 |
| Iron Paint, Ground in oil, Brown | 10 @ 24 1/2 |
| Iron Paint, Ground, Purple | 10 @ 24 1/2 |
| Litharge | 10 @ 14 1/2 |
| Mineral Paints | 10 @ 14 1/2 |
| Orange Mineral | 10 @ 14 1/2 |
| Red Lead, American | 10 @ 14 1/2 |
| Red Venetian (Eng.) dry | 10 @ 14 1/2 |
| Red Venetian in oil, ass'd cans, 114; kegs, 84 | |
| Red Indian Dry | 10 @ 14 1/2 |
| Rose Pink | 10 @ 14 1/2 |
| Sienna, American Raw, powdered | 10 @ 14 1/2 |
| Sienna, Burnt, in oil | 10 @ 14 1/2 |
| Sienna, Raw, in oil | 10 @ 14 1/2 |
| Umber, Burnt, powdered | 10 @ 14 1/2 |
| Umber, Raw, powdered | 10 @ 14 1/2 |
| Umber, Raw, in oil | 10 @ 14 1/2 |
| Vermilion, Chinese | 10 @ 14 1/2 |
| Vermilion, English | 10 @ 14 1/2 |
| Vermilion, American Common | 10 @ 14 1/2 |
| White Lead, American pure dry, in oil | 10 @ 14 1/2 |
| White Lead, American pure dry, in oil | 10 @ 14 1/2 |
| White Lead, French (Paris Dry) | 10 @ 14 1/2 |
| Yellow Ochre, French, in oil | 10 @ 14 1/2 |
| Yellow Ochre, French, in oil | 10 @ 14 1/2 |
| Yellow Ochre, Vermont | 10 @ 14 1/2 |
| Yellow Chrome | 10 @ 14 1/2 |
| Yellow Chrome, in oil | 10 @ 14 1/2 |
| Zinc White, American No. 1, dry | 10 @ 14 1/2 |
| Zinc White, American No. 1, in oil | 10 @ 14 1/2 |
| Zinc White, French (Paris Dry) | 10 @ 14 1/2 |
| Zinc White, French, in oil | 10 @ 14 1/2 |

| Oils. | |
|--|-------------|
| Bleached Whale, gal | 43 @ 44 1/2 |
| Bleached Sperm, gal | 65 @ 71 1/2 |
| Fish Oil, Pressed | 26 @ 27 1/2 |
| Lard, Prime Winter | 63 @ 65 1/2 |
| Cylinder Oil | 70 @ |
| Machinery | 45 @ |
| Engine | 45 @ |
| Linseed, Raw, in casks and bbls | 18 @ 30 1/2 |
| Linseed, Boiled, in casks and bbls | 18 @ 30 1/2 |
| Neatsfoot | 45 @ 65 1/2 |
| Cotton Seed, Refined | 41 @ 44 1/2 |

| Sundries. | |
|---|---------------|
| Asphaltum, Cuban, gal | 5 1/2 @ 6 1/2 |
| Asphaltum, Egyptian | 8 @ 9 1/2 |
| Benzine, 62°, gal | 8 1/2 @ 9 1/2 |
| Coal Tar, gal | 10 @ 11 1/2 |
| Chalk, Block | 5 @ |
| Crucibles, No. 14 and upward, gal | 3 1/2 @ |
| Flour Emery, 300 lb kegs | 4 @ 4 1/2 |
| Flour Emery, finest quality | 2 1/2 @ 2 3/4 |
| Glue, White | 18 @ 30 1/2 |
| Glue, Sheet | 18 @ 30 1/2 |
| Glauciers' Points, Zinc, gal | 4 1/2 @ |
| Gum, Copal | 36 @ |
| Gum, Damar | 35 @ |
| Gum, Shellac, English, dark | 25 @ |
| Mineral Wool, ordinary, gal | 1 @ 1 1/2 |

| | |
|---|---------------------|
| Mineral Wool, extra | 3 @ 3 1/2 |
| Naphtha, 70° | 9 @ 10 1/2 |
| Naphtha, 76° | 9 1/2 @ 10 1/2 |
| Pumice Stone, selected lumps | 3 @ 9 1/2 |
| Pumice Stone, powdered | 3 @ 9 1/2 |
| Pine Tar, bbls | \$2.10 @ \$2.12 1/2 |
| Pitch | \$1.40 |
| Plumbago, E. I. Po., gal | 4 @ 6 1/2 |
| Plumbago, American, gal | 6 @ 10 1/2 |
| Plumbago, Gun Powder Glazing, gal | 10 @ |
| Plumbago, Shot Polish, gal | 10 @ |
| Putty, in bladders | 2 1/2 @ |
| Putty, in bulk | 1 1/2 @ 2 1/2 |
| Rosin, Strained and Good | \$1.30 @ \$1.35 |
| Rosin, G. & H. | \$1.45 @ \$1.50 |
| Rosin, I. & K. | \$1.65 @ \$1.70 |
| Rosin, M. & N. | \$2.05 @ \$2.05 |
| Spirits Turpentine, gal | \$1.30 @ \$1.35 |
| Stove Polish, Dixon's | gal gross, \$5.50 |
| Stove Polish, Rising Sun | 4.00 |
| Stove Polish, Gem | 4.00 |
| Stove Polish, Jet Black | 3.00 |
| Waste, No. 1 Cop | 8 1/2 @ |
| Waste, No. 1 White Machine | 8 1/2 @ |
| Waste, No. 2 White Machine | 8 1/2 @ |
| Waste, No. 1 Colored | 8 1/2 @ |
| Waste, No. 2 Colored | 8 1/2 @ |
| Waste, Washed Machine | 8 1/2 @ |
| Whiting, Spanish, gal 100 lb | 50 @ |

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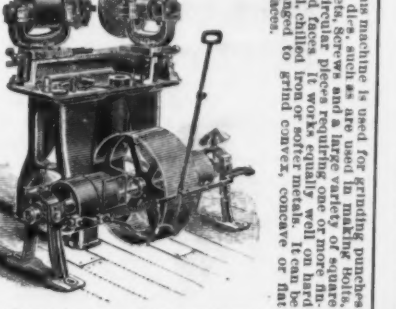
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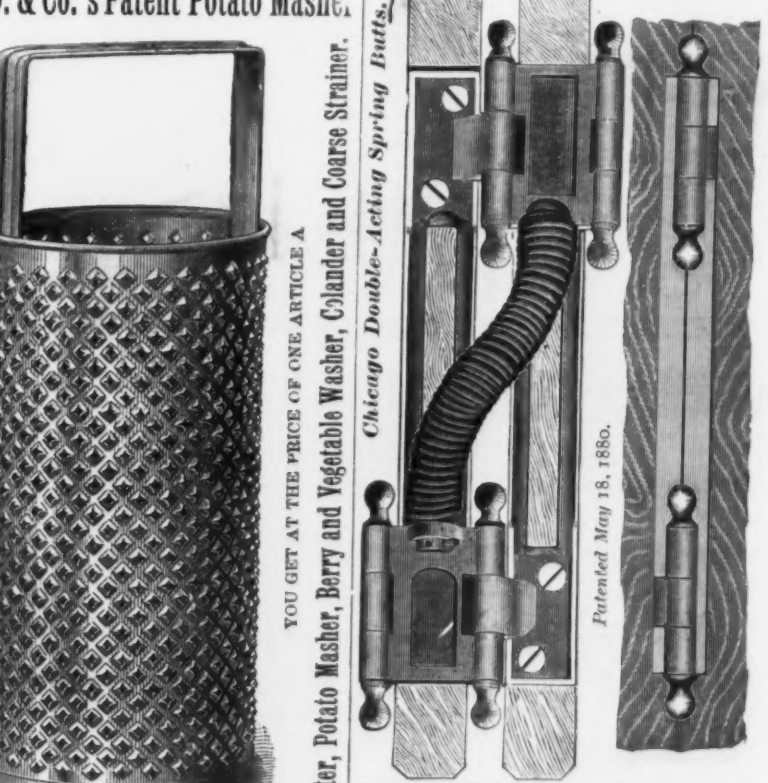
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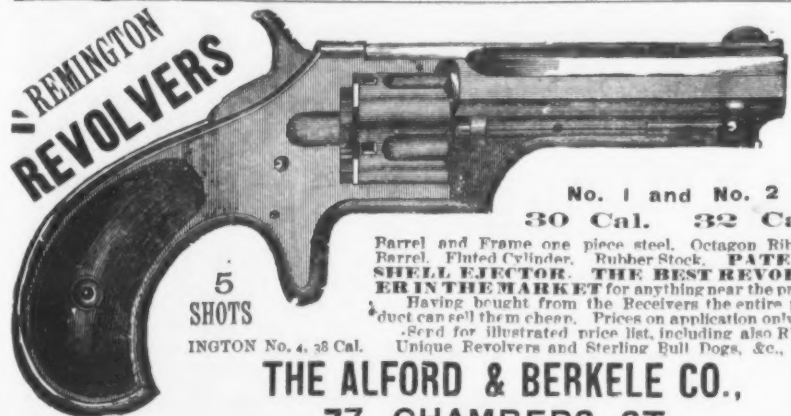
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CONDITIONS OF WARRANTY:

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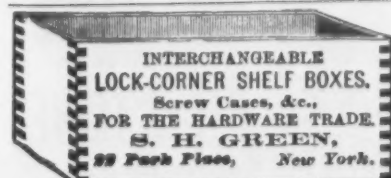
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THE WEEK.

The great Government dry dock at Mare Island Navy Yard, which cost \$3,000,000, is reported to be dangerous on account of the settling of a portion of the masonry near the caisson. A granite block is broken in two, betraying a weakness that threatens the structure. The difficulty is attributed to lack of piling in the defective sections, while the main section is adequately protected.

Grand Master Workman Powderly, in a series of letters to the order he represents, eulogizes machinery as an adjunct of labor. He sees "in the revolving wheels of machinery that which will work out the problem of labor's emancipation"; in its busy hum he hears "the noise of a mighty power urging men and women on to real progress."

Gov. Joseph R. Budwell, of Maine, whose name has been long associated with the granite industry of that State and with the lumber business, died at Hallowell on the 15th inst., from paralysis of the heart.

Dr. Dupre, the Government expert who examined a sample of the cotton from the cargo of the steamer City of Montreal, which was partially burned at sea, discredits the theory of spontaneous combustion. The danger in cotton cargoes is that during the storage a bale ignited by friction, by sparks from passing pipe, or from a tobacco pipe or the lamps used in stowing, may be unnoticed until the ship has been several days at sea.

The official report shows that 4,000,000 barrels of salt were inspected in Michigan last year, or about 300,000 barrels in excess of the inspection in 1886.

Louisiana papers agree with the statement of the Cotton World that there has been a lessened production of cotton, notwithstanding the increased acreage under cultivation. The principal reason assigned is the impoverishment of the soil, due to the conversion of the seed into oil instead of using it as a fertilizer. This evil, however, is being corrected. The New Orleans Times-Democrat says planters are recognizing the folly of selling all their seed. The amount now crushed is less than formerly, and even when the seed is taken from the soil the farmers usually return the meal to supply the elements of which it is denuded.

It is reported that George J. Gould, since his return from the West, favors the purchase of new steamships for the Chinese trade, to ply in the Pacific Mail Line.

Lengthening the term of military service in the Landsturm, as now proposed in consequence of the warlike tone of European cabinets, is likely to give a new impetus to German emigration to the United States.

The bill to regulate immigration, introduced in the Senate by Mr. Reagan, authorizes the Secretary of the Treasury to appoint inspectors of immigration, who shall have the power to board vessels and remove immigrants therefrom in order to ascertain whether they are prohibited from landing under the act. The master of the vessel must produce a certificate for each immigrant, showing that such immigrant is neither a criminal, a pauper nor an idiot, and is not an "assisted immigrant," nor under contract to labor in the United States. All unfit persons shall be returned at the expense of the owners of the vessel.

An examination of the accounts of the Newark, N. J., Aqueduct Board reveals a probable deficiency of almost \$1,000,000.

The Erie ferry-boat Pavonia and the Old Dominion steamer Breakwater came into collision in the North River on Friday. The blow was so violent that the side of the ferry-boat was crushed in for 18 feet, and a hole the size of a barrel was punctured in the iron plate work of the Breakwater.

According to a statement by the St. Louis and Mississippi Valley Transportation Company, the grain traffic of the river during the past summer was reduced more than 50 per cent. from the average of former years, owing to low water, and only 3,000,000 bushels were exported, but the trade has recently taken a fresh start and the outlook is more cheerful.

The plan to secure a representation at Washington City of the 15 Spanish American Republics, for the purpose of conferring upon commercial relations and kindred topics, is again before Congress. Representative McCrery, of Kentucky, a leading advocate of this measure, regards this as the favorable opportunity to promote the extension of trade. There are 55,000,000 people whom we can reach by railroad. The Argentine Republic, away down in the Southern extremity, has a railroad running up to its northern border. The Mexican railroads meet our own at our southern boundary, and there are inducements offered by some of the Republics for the building of railroads. Connection could be established with the most remote Republic. The value of the markets that could be opened up to us in this direction cannot be calculated. The trade naturally belongs to the United States.

The Attorney-General of Canada, while in New York a few days ago, spoke of a strong feeling in that country favorable to reciprocity with the United States, but he represented that the necessity for such a measure was much less now than it was 25 years ago. He volunteered the opinion, however, that an international arrangement, particularly with reference to the products of the farm, forest, fisheries and mines, would be

beneficial to Canada. The party now in power have favored it, and adhere to the policy. An indication of this, he said, is that "Parliament has given power to the Governor-General and the Council to put on the free list, by order of the Council, a variety of products, such as fish, grain and lumber, whenever it shall appear that the United States will put them on the free list. Any tariff changes in the United States which would enable such kinds of trade as I have mentioned to be developed would be welcomed in Canada."

Rastus S. Ransom, Surrogate elect for New York, speaks of the rapid increase of the business of the Surrogate's Court, and the necessity for appointing two assistants.

The performances of the new steel cruiser Chicago under the contract trial for horsepower in Long Island Sound, 16th inst., are reported to demonstrate the complete success of the vessel, exceeding all expectations. Beginning at 9.30, the engines were kept in full speed for six consecutive hours without accident of any kind. The mean revolutions per minute were 69 1/2, and the horsepower exceeded that called for in the contract. The members of the Advisory Board who accompanied the ship express satisfaction at the results attained. The speed obtained was slightly in excess of 15 1/2 knots an hour. The boilers furnished all the steam required without the use of forced draft.

The discovery of the embezzling of \$67,400 of the funds of the Manufacturers' National Bank, of Philadelphia, by its aged and for over 20 years trusted clerk, Joseph C. Knight, excites an unusual sensation among business men in that city, and has caused a general overhauling of accounts among financial institutions to see that all is right.

The Yellow River, in China, suddenly broke through its embankments and returned to its ancient bed. The consequence was the conversion of a populous valley into a lake 30 feet in depth in the province of Honan, causing an appalling loss of life and destruction of property. The district submerged comprises 7000 square miles. Millions of Chinese are starving.

Semon Bache & Co., glass importers, of this city, have recently obtained three verdicts in their favor in the local courts, the first for \$10,000, more recently one for \$2000, and on Friday last, in the Court of Common Pleas, a verdict for \$1200 in addition, on account of injury done to tenement-house property through the operations of the Elevated Railway in front of their premises.

The latest Government experiment in sugar-making in Louisiana yielded 143 pounds per ton of cane, which is 13 pounds beyond expectations and the best result obtained thus far.

The new coast fast freight route of the Pennsylvania Railroad is proving a success, and is very largely patronized by Southern fruit growers. Orange shipments from Florida are increasing in volume because of the improved transportation facilities.

Assistant-Secretary Maynard, in a letter to the Collector of Customs at Philadelphia, says: "The Department takes this occasion to say for the information of the United States Appraiser at your port that neither the law nor the decisions of court are construed as authorizing the United States Appraiser to reconsider or modify his report of appraisement after it has been duly lodged with the Collector of Customs, notwithstanding it may be that a reappraisement has been demanded and the Collector has directed him to furnish the special report required by article 464 of the regulations."

The death of the father of the Emperor of China, who headed the liberal or progressive party in the country, is a bad omen for the proposed great banking scheme for which the so-called Wharton-Barker syndicate received special concessions. The event referred to may mean an entire change of administration unfavorable to foreign enterprise as affecting China.

A German-Chinese bank is about to be established by the Rothschilds and other large firms in Hamburg, Frankfurt and Berlin, and the project includes branches at all the treaty ports.

The freight blockade on the Central Pacific Railroad between San Francisco and Ogden is the worst ever known.

The Secretary of the Navy has called for proposals for the construction of a submarine torpedo-boat, complete with torpedo appendages, to be of the best and most modern design, and to be constructed of steel. The report of the Board on Coast Defences recommended submarine torpedo-boats as one of the auxiliary aids to the great monitors in protecting our coast and harbors.

A fire in St. Augustine, Fla., destroyed Hamblin's hardware store and much other valuable business property. Hamblin & Co.'s loss on stock is estimated at \$100,000, on building \$10,000.

The "Keely motor" has again been heard from. At the annual meeting of directors in Philadelphia last week Mr. Keely referred to the laborious laboratory experiments in connection with the "liberator," which, in connection with the "generator," was to enable him to apply the etheric vapor generated, these being still surrounded with difficulty, and in the meantime new discoveries were made which render both the generator and liberator, as well as the vaporic force,

unnecessary. This new discovery Mr. Keely spoke of as "vibratory sympathy," and he looked forward to great success, perhaps in six months or sooner. Meanwhile, investors whistle for their dividends.

In answer to a resolution adopted by the House at the close of the last session the Secretary of the Treasury has sent to that body a communication embodying the results of the inquiry made by the Supervising Inspector-General of Steam Vessels into the methods of constructing and heating passenger cars and steamboats so as to prevent loss of life and property by fire. Two hundred and sixteen answers were received. Twenty-eight contemplated heating cars by steam from the locomotive, 12 heated by hot air from the locomotive, 23 heating by heat from an independent car, 26 heating and lighting by electricity, 54 heating by improved heaters or stoves in cars, 8 prevention of disaster by fire by means of specially constructed safety cars, 1 heating and lighting by gas and 84 miscellaneous.

Judge Francis H. Dewey, of Worcester, Mass., for many years director and law adviser of the Washburn & Moen Mfg. Company, and otherwise prominent in business circles, died in that city, 16th inst., of apoplexy.

Secretary Fairchild has ordered the dismissal of all employees not absolutely necessary in customs districts where the revenue has not equalled the cost of collection, and the abandonment of rented buildings, &c.

The reduction in rates from Chicago and Missouri River points, lately put into effect, had the effect of transferring to Chicago much of the trade with Colorado previously controlled by California. The Pacific Coast lines now retaliate by putting into effect a tariff with rates sufficiently low to insure a return of the business, especially lumber, to California merchants.

Trunk Line Commissioner Fink has received the new schedule of export rates from Chicago to European ports, adopted on Thursday by the Export Freight Committee of the Central Traffic Association. The new rates will go into effect on Tuesday, December 27, and are, per 100 pounds, as follows to the principal foreign ports:

| | Bacon, pork and beef in packages. | Lard and tallow in packages. | Flour in sacks. | Corn and wheat in bulk. |
|----------------|-----------------------------------|------------------------------|-----------------|-------------------------|
| Liverpool..... | 47 | 46 | 36 | 33 |
| London..... | 49 | 48 | 38 | 36 |
| Glasgow..... | 50 | 49 | 38 | 38 |
| Bristol..... | 55 | 55 | 41 | .. |
| Rotterdam..... | 52 | 52 | 42 | .. |
| Amsterdam..... | 53 | 53 | 43 | .. |
| Hamburg..... | 50 | 50 | 41 | .. |
| Bremen..... | 50 | 50 | 42 | .. |
| Antwerp..... | 49 | 49 | 39 | .. |

The rate for cheese from Liverpool to Chicago is 68 cents per hundred; to London, 75; to Glasgow, 78, and to Bristol, 78, and the rates for butter to the same ports are 83, 90 and 93 cents per hundred. Tobacco and cotton rates are not fixed.

Engineer Chas. H. Haswell is preparing plans for a new fire-boat, for use on the water front in New York Harbor.

The settlement of long disputed claims between the Lehigh Valley and Central Railroad companies, of New Jersey, in reference to lands in Jersey City on the line of the Morris Canal removes all impediments to important terminal improvements on what is known as the West Line Grant. Under the adjustment now amicably reached the freight of the Lehigh Valley Railroad can pass over the tracks of the Jersey Central to the new depot about to be established, while the passenger traffic can be done over the Pennsylvania tracks, as at present. In order to perfect the delivery of freight at this terminal point, the 10-mile road now under construction by the Lehigh Valley Company from South Plainfield station, just back of Metuchen, and running to Roselle on the Central Railroad, near Elizabeth, is being pushed forward vigorously and will be completed in the early spring.

The California and Oregon Railway was completed on Saturday. This event represents 21 years of railway construction, almost steadily pushed through the mountain ranges of Northern California and Southern Oregon. The accomplishment is regarded in commercial circles on the Pacific Coast as the most important in its significance since the completion of the first overland railway system in May, 1867. It affords for the first time all-rail communication between cities of the Pacific Coast from the southern to the northern boundary and places under the control of one rail way corporation an unbroken line from New Orleans to Portland, Ore., a distance of 3000 miles. A San Francisco correspondent says the trade of that city will be greatly stimulated by the new line. Before the completion of the Northern Pacific San Francisco had virtual control of this northern trade, but the opening of Villard's line and the extremely low rates placed on through freights from the East proved more than the San Francisco dealers could stand. In many lines of manufacture they were practically driven out. In mining machinery, iron, copper, lead and hardware the merchants of that city have a practical monopoly of the Portland market, but the last year has seen their trade in paper, stationery, books, crockery and glassware, tobacco and furniture reduced more than three-quarters by the sharp competition of Eastern firms, aided by excessively low through freights.

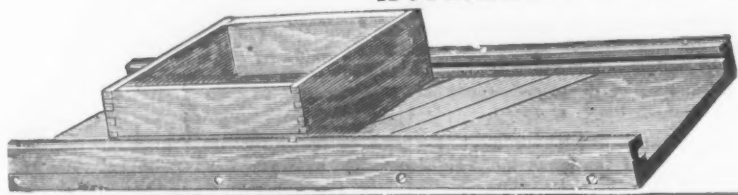
The new Mexican Legation building in Washington City, just completed, is a three-story double house of pressed brick, elegantly finished.

TUCKER & DORSEY MFG. CO., INDIANAPOLIS, U. S. A.

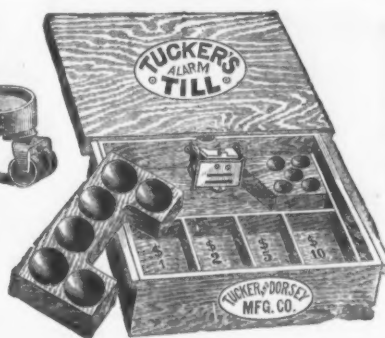
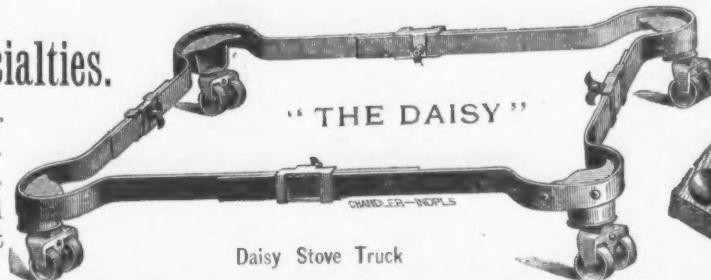
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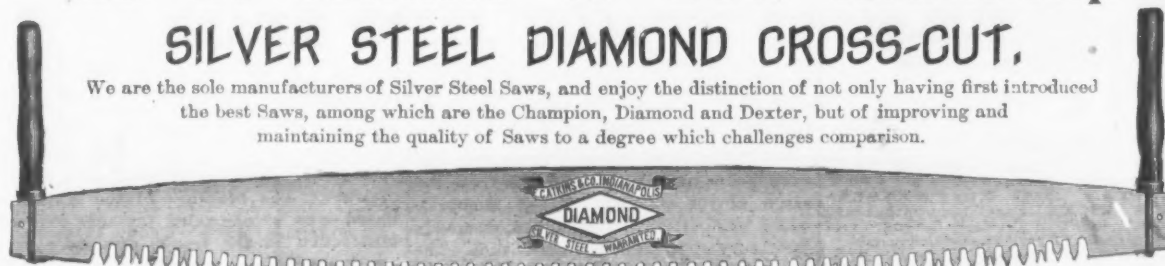
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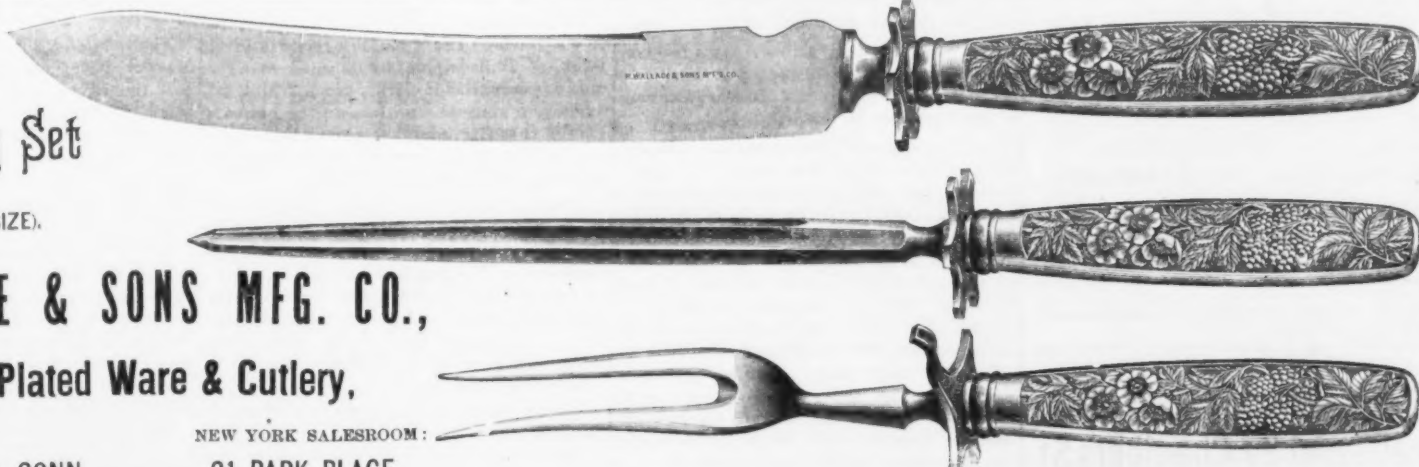
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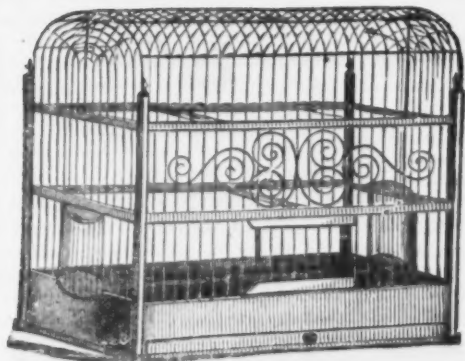
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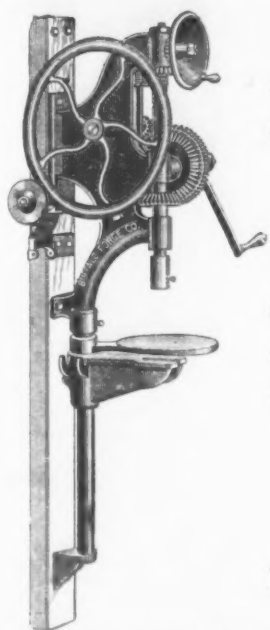
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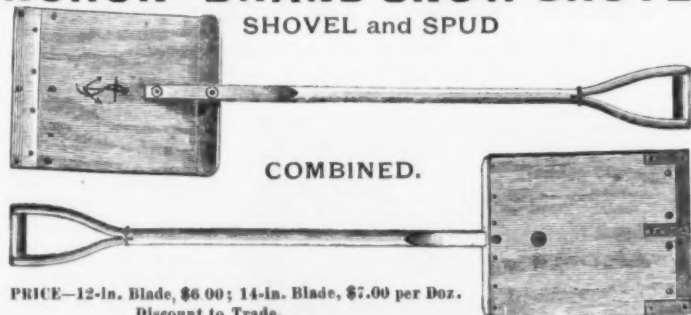
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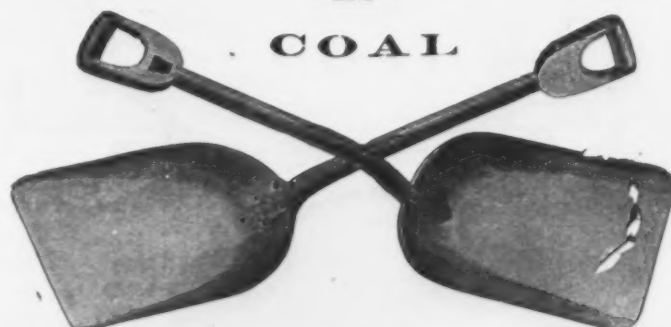
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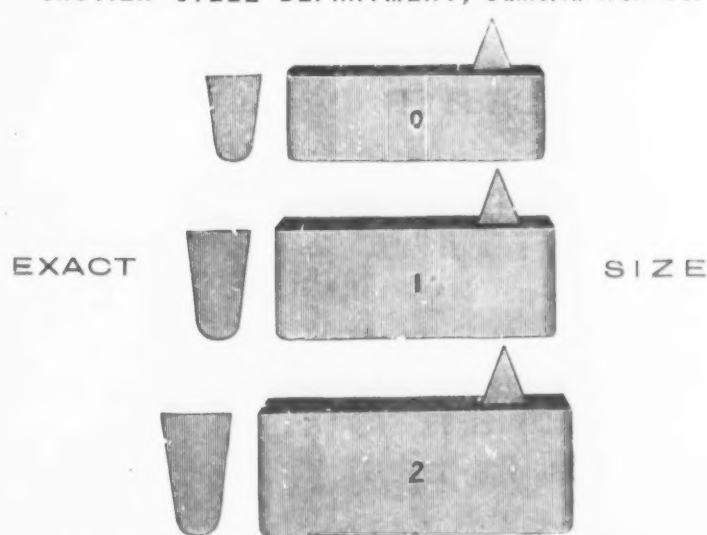


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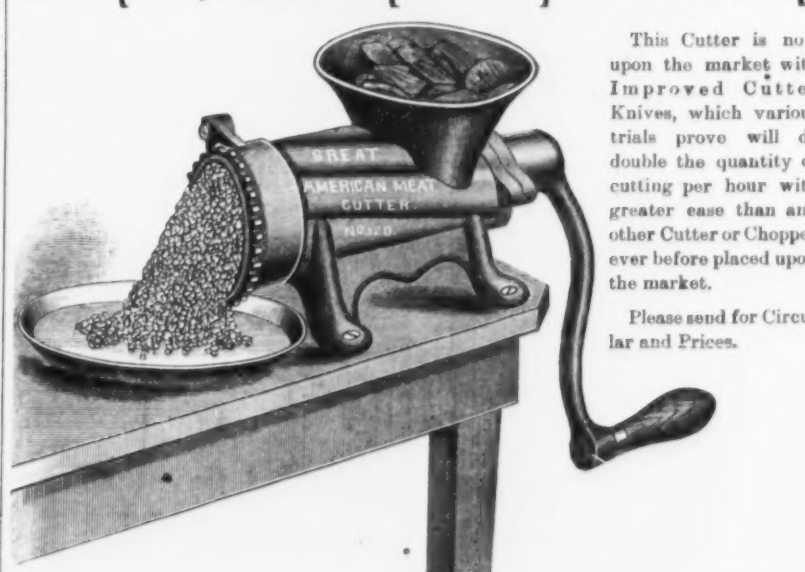
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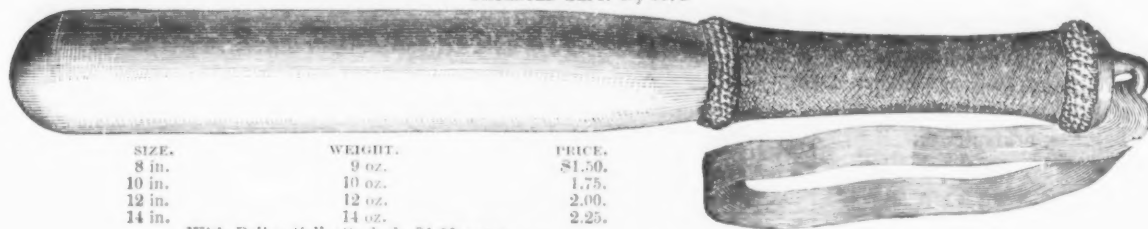
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|--------|---------|---------|
| 8 in. | 9 oz. | \$1.50. |
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| 12 in. | 12 oz. | 2.00. |
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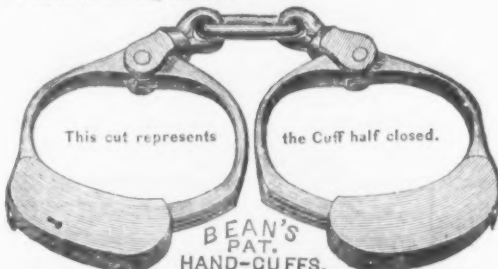
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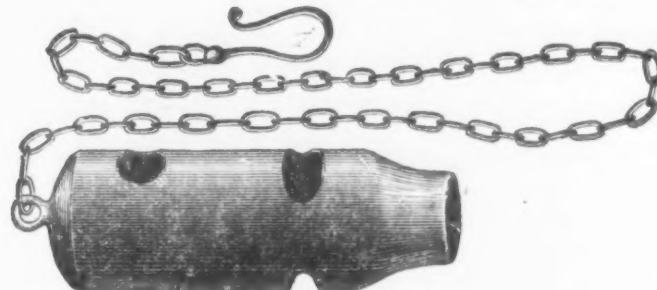
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This cut represents the Cuff half closed.
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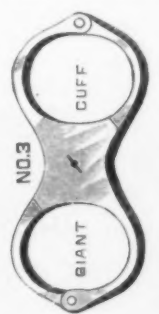


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For Conveying a Prisoner aboard a railroad train.
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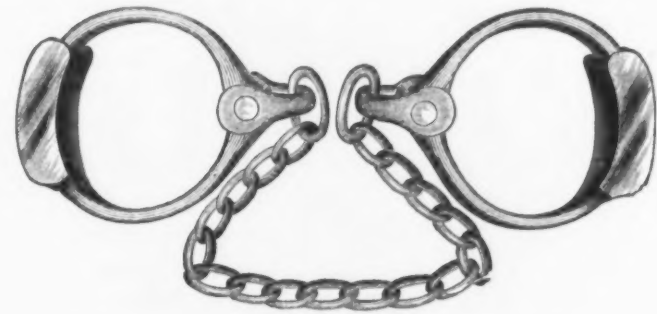
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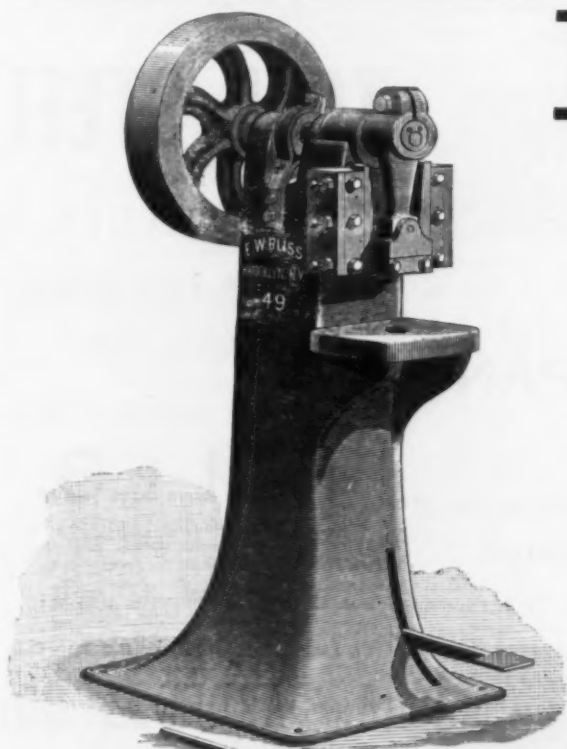
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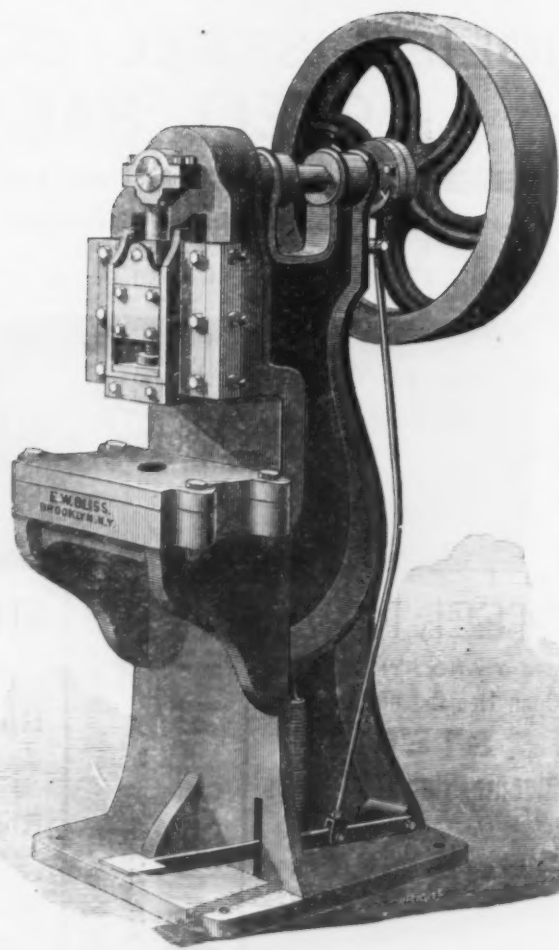


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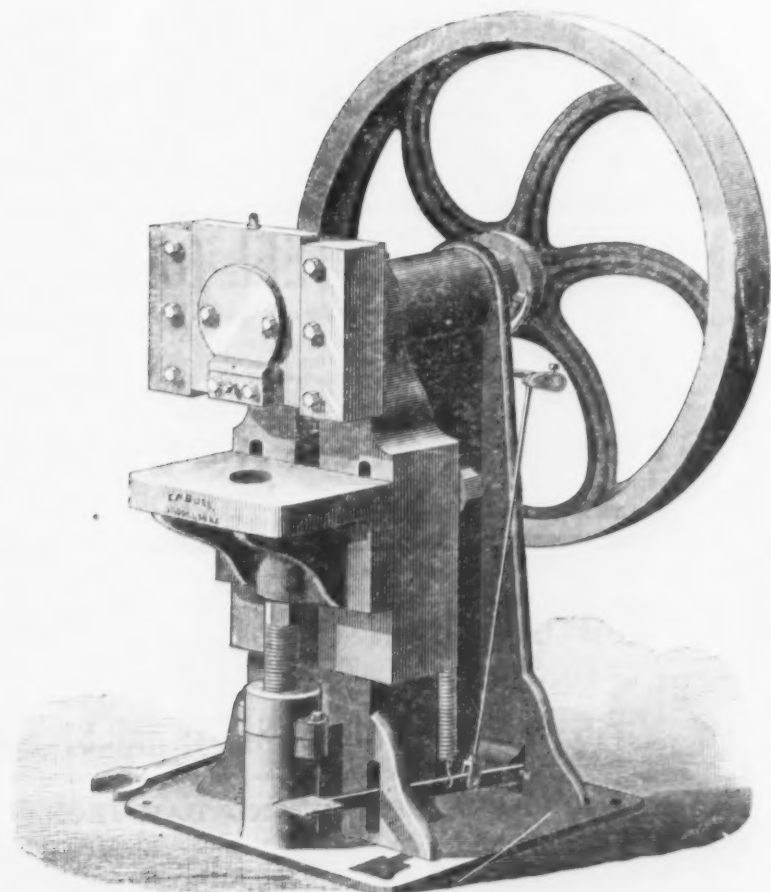
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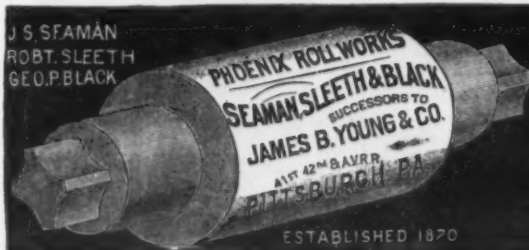
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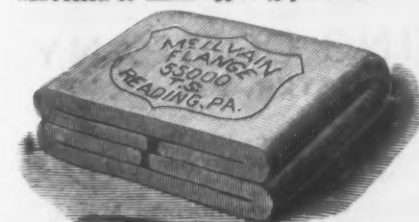
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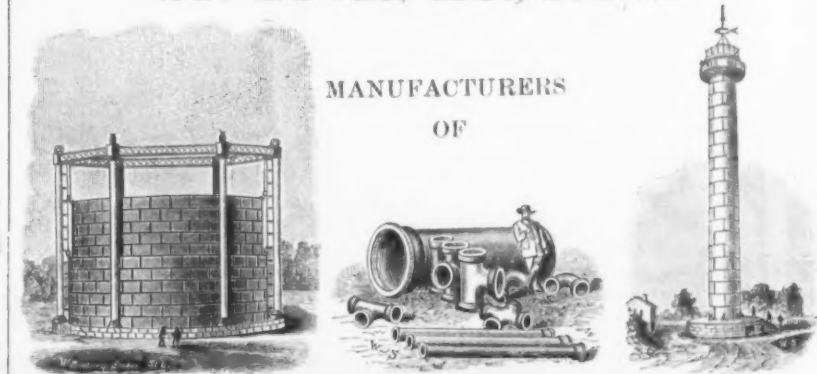
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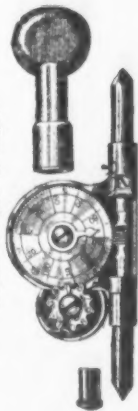
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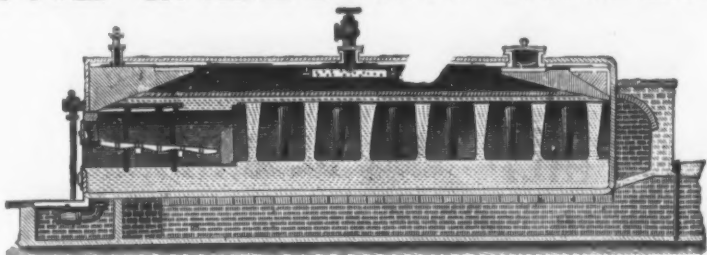
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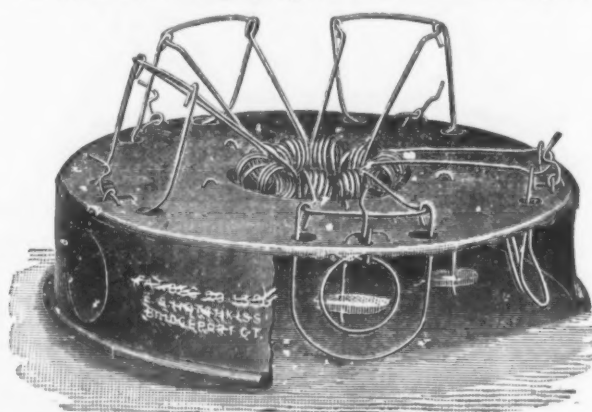
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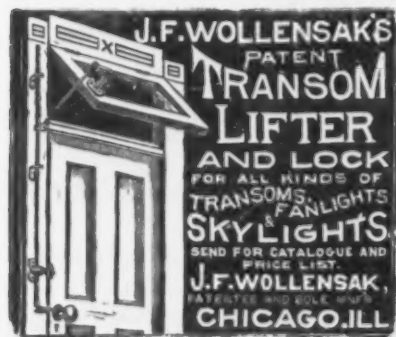
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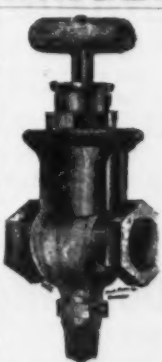
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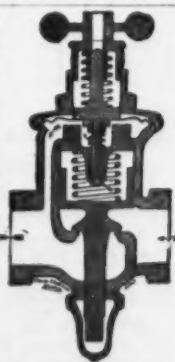
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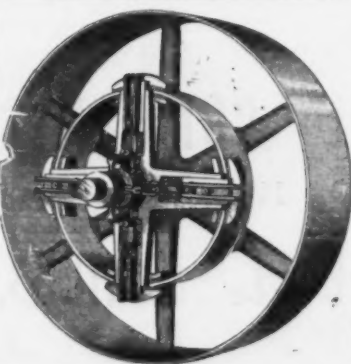
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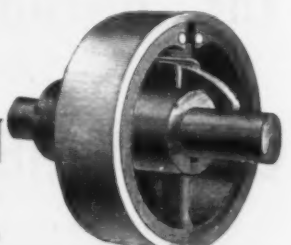
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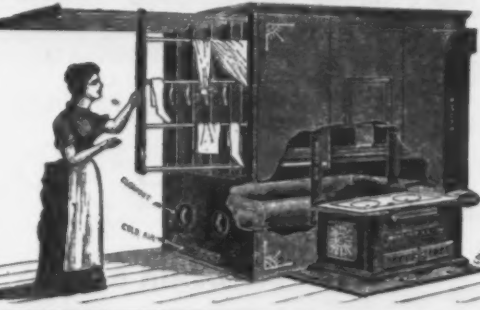
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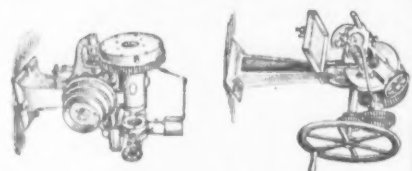
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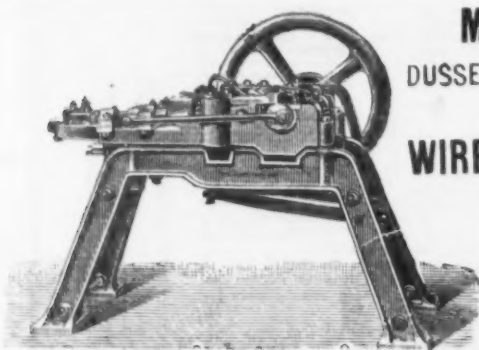
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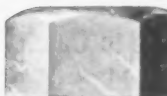
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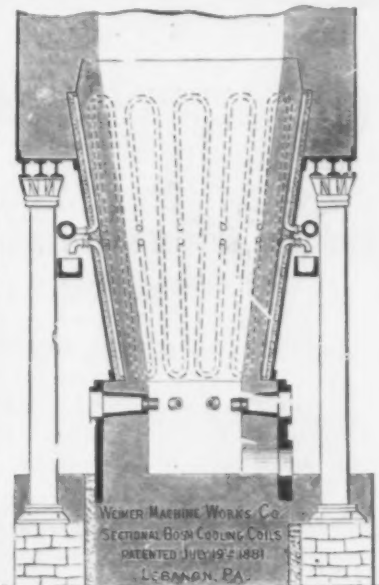
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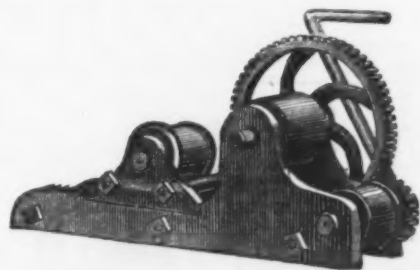
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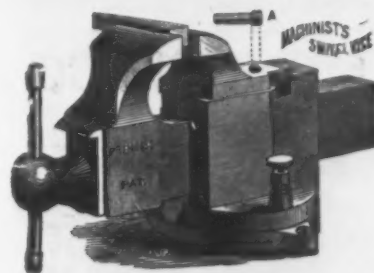
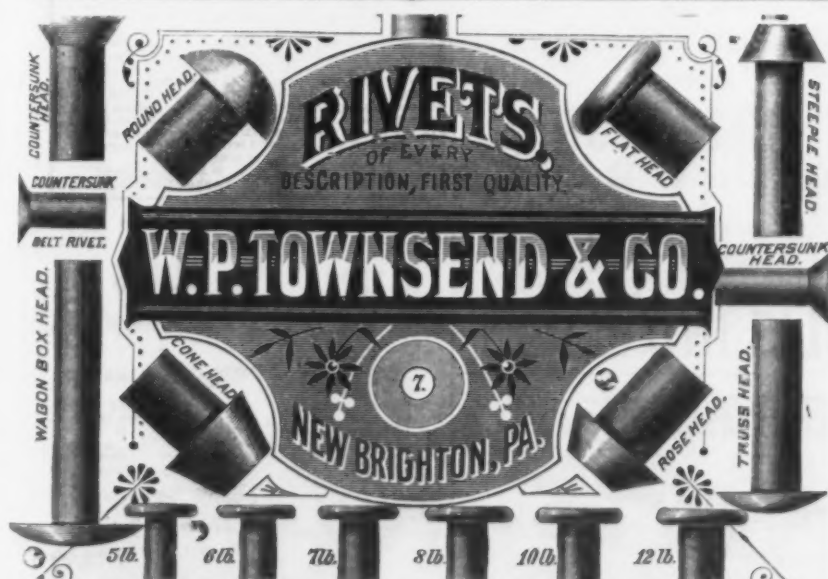
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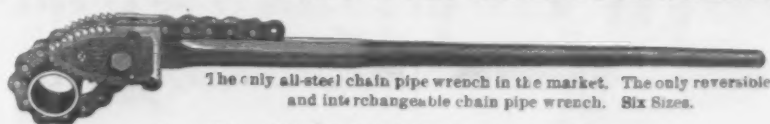
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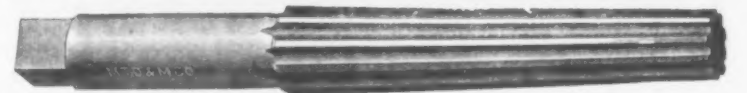
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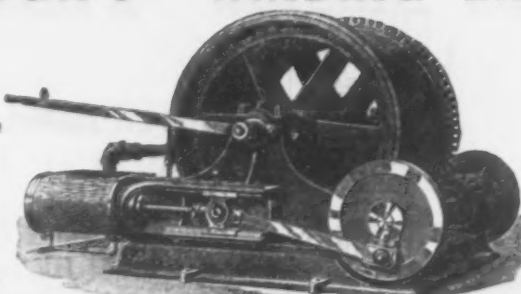


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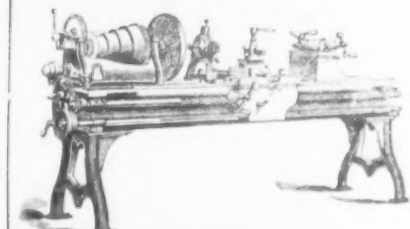


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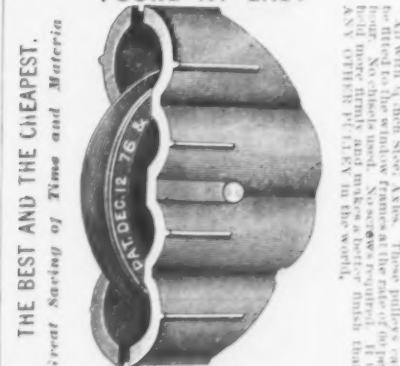


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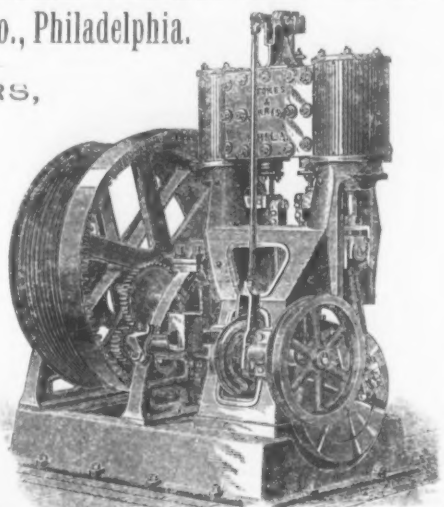
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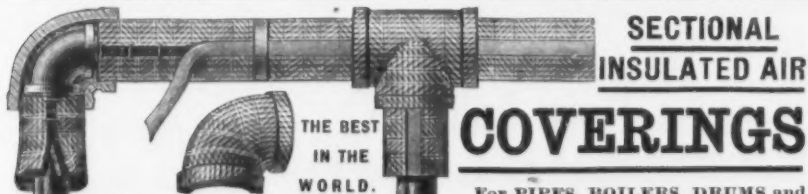
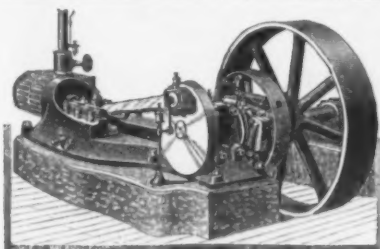
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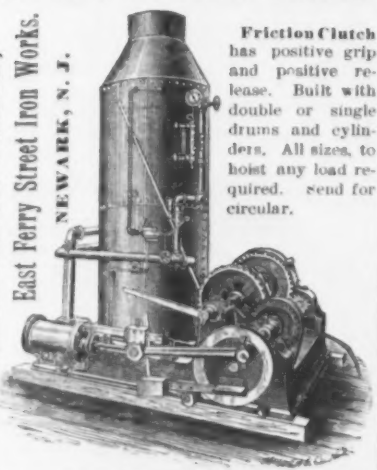
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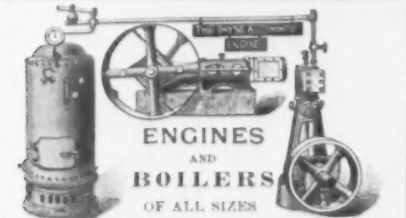
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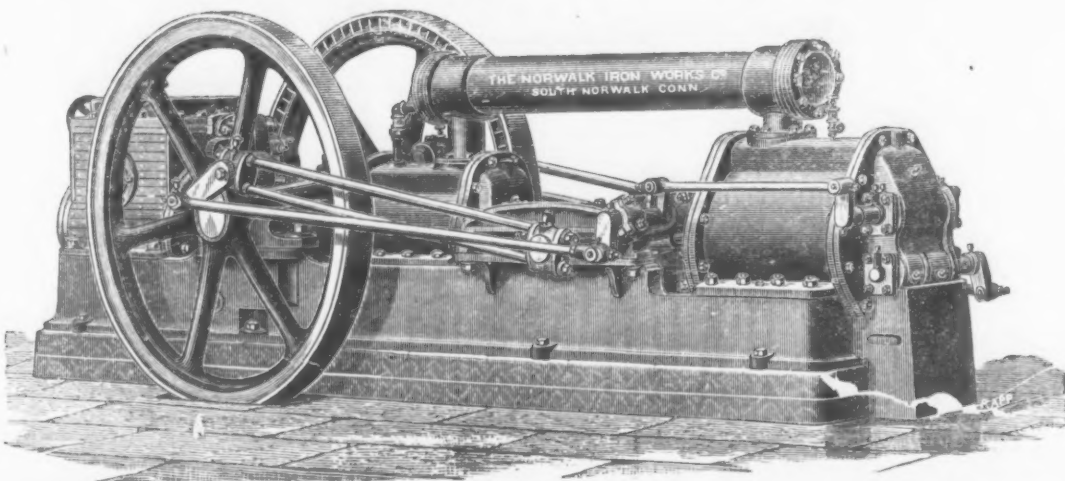
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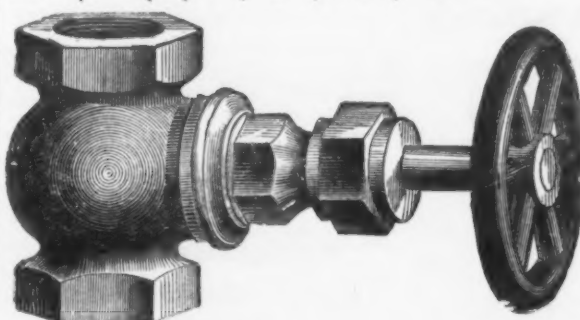


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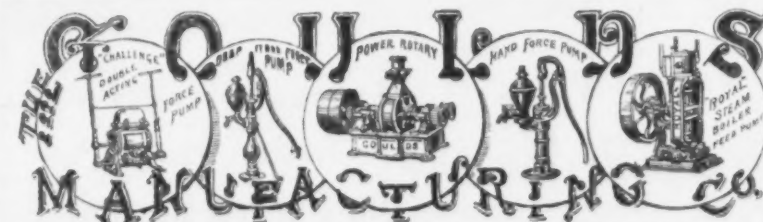
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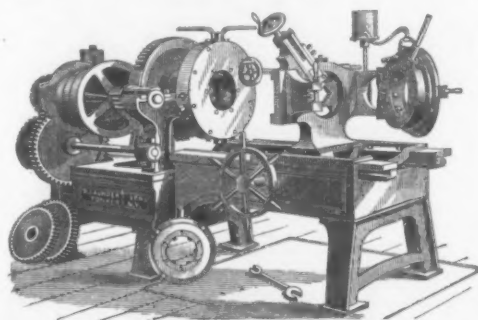
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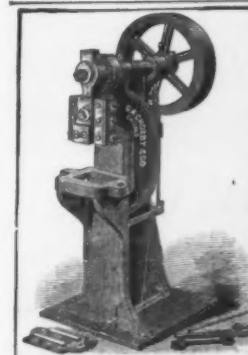
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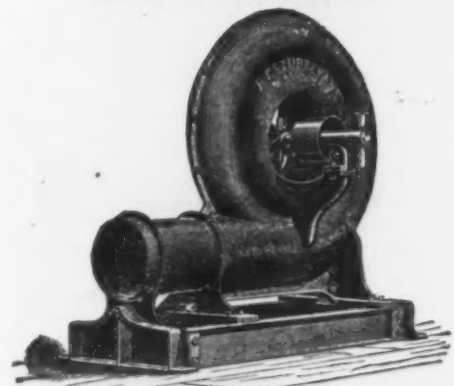
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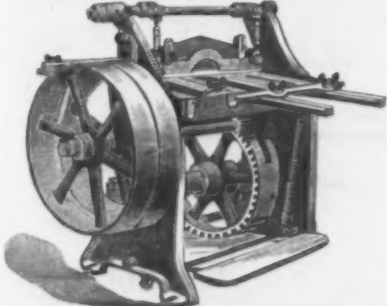
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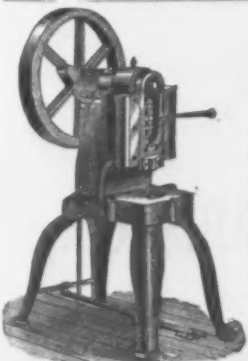
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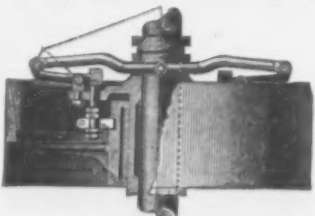
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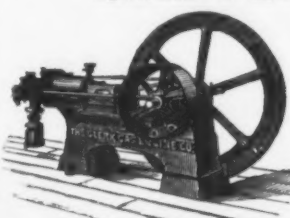
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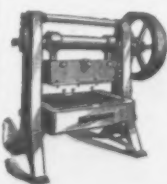
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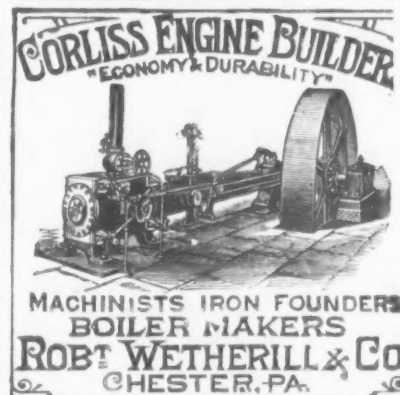
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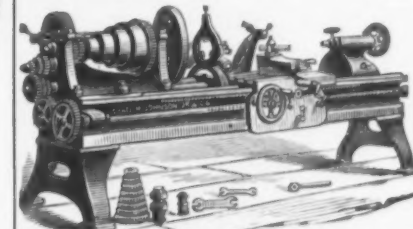
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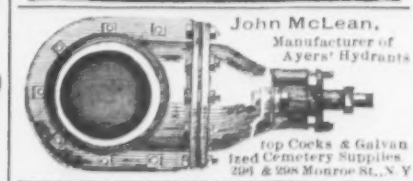
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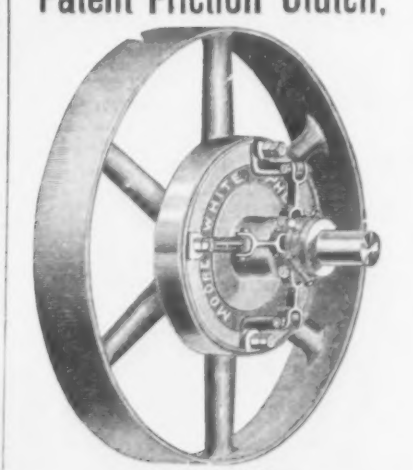
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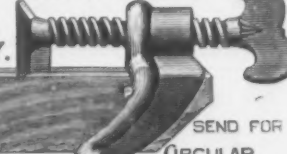
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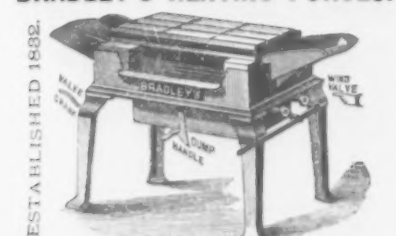
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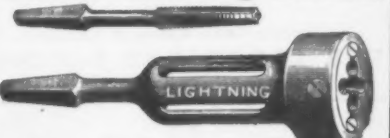
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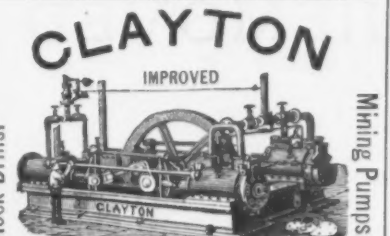
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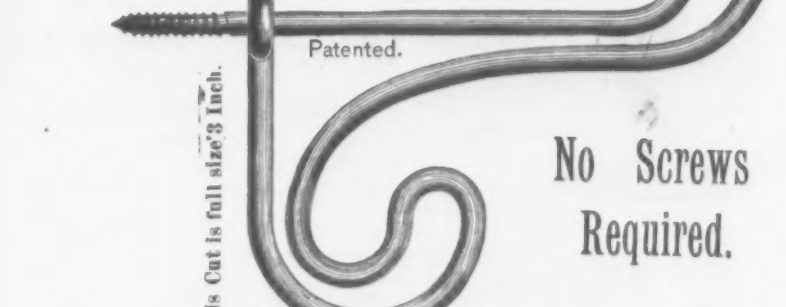
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